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Smith et al.

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(54) **STRAP SECURING SYSTEMS FOR ARTICLES OF FOOTWEAR AND OTHER FOOT-RECEIVING DEVICES**

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(51) **Int. Cl.**

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A43B 3/12	(2006.01)
A43B 5/00	(2006.01)
A43B 7/20	(2006.01)

(52) **U.S. Cl.**

CPC ***A43C 11/1493*** (2013.01); ***A43B 3/126*** (2013.01); ***A43B 5/00*** (2013.01); ***A43B 7/20*** (2013.01)

(58) **Field of Classification Search**

CPC A43C 11/14; A43C 11/1493; A43C 11/00; A43C 11/20; A43C 1/00; A43C 1/04; A43C 1/003; A43C 1/006; A43B 7/14; A43B 7/18; A43B 7/19; A43B 7/20; A43B 3/126; A43B 23/02

See application file for complete search history.

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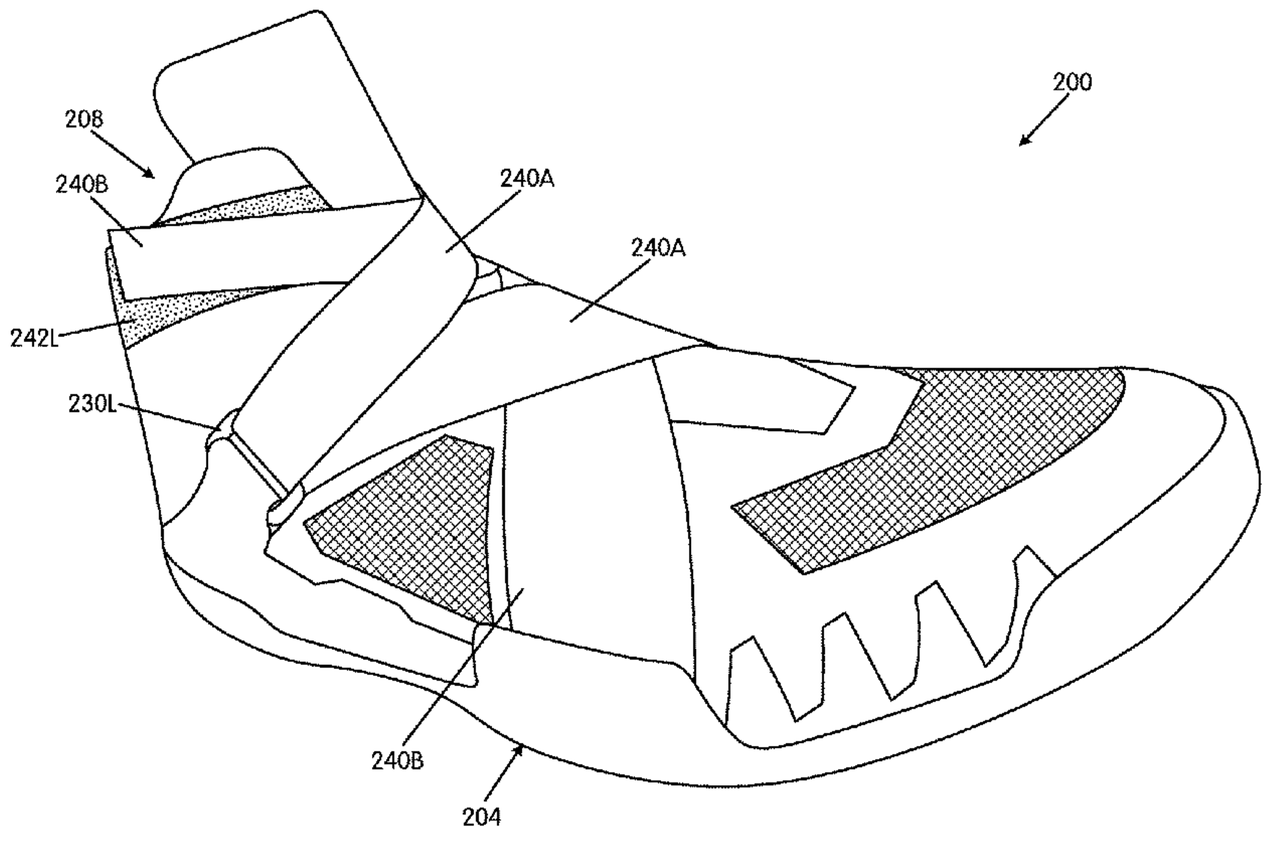
(57) **ABSTRACT**

Articles of footwear or other foot-receiving devices include an upper/foot-covering member having medial and lateral strap tensioning components located on opposite sides of the ankle area. A securing system is provided that includes: (i) a first strap portion extending across the instep area, engaging the lateral strap tensioning component, and extending in front of the foot-insertion opening to the medial ankle side (where it may be secured), and (ii) a second strap portion extending across the instep area, engaging the medial strap tensioning component, and extending in front of the foot-insertion opening and to the lateral ankle side (where it may be secured). The first and second strap portions cross one another at two separated crossing locations.

24 Claims, 15 Drawing Sheets



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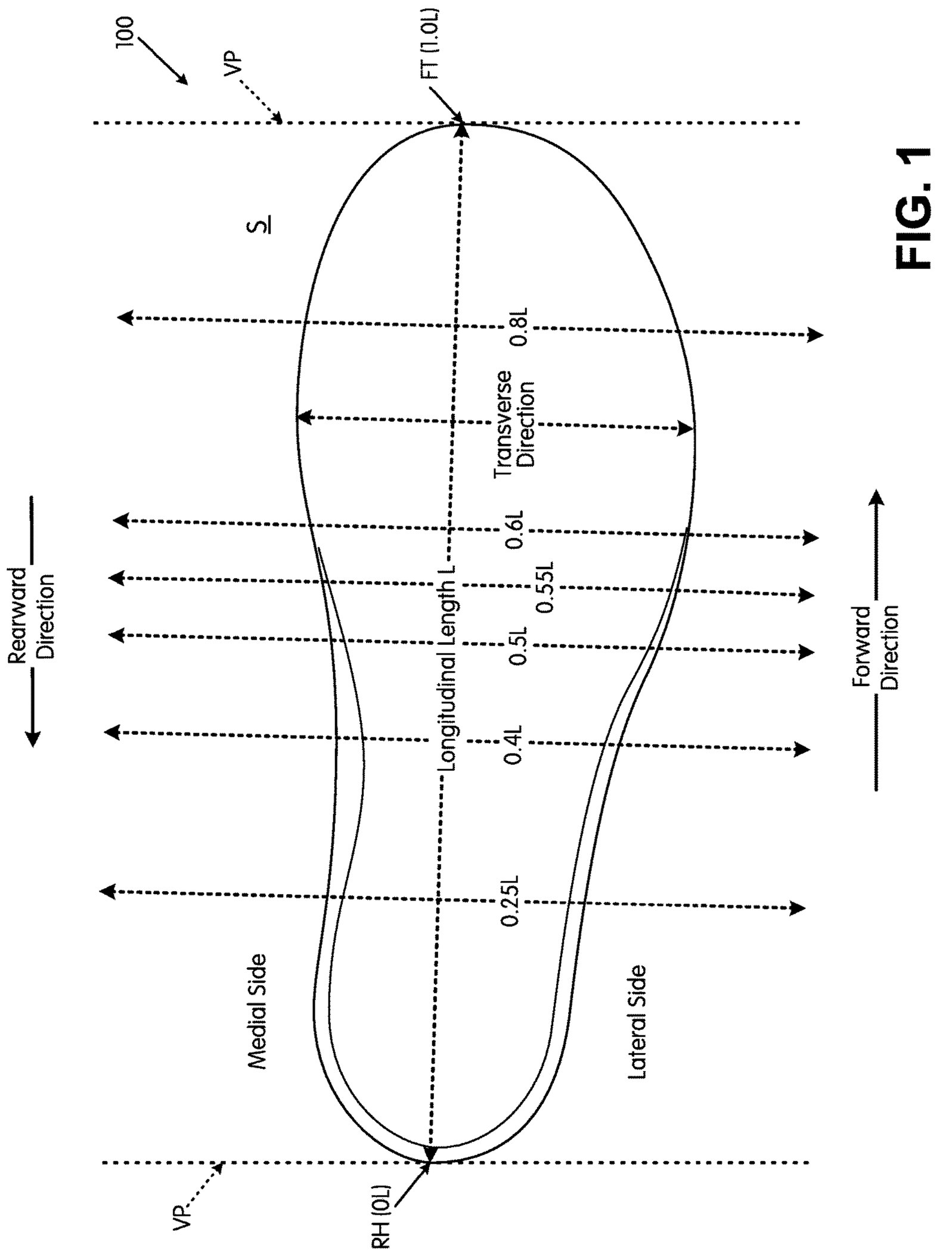
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VP
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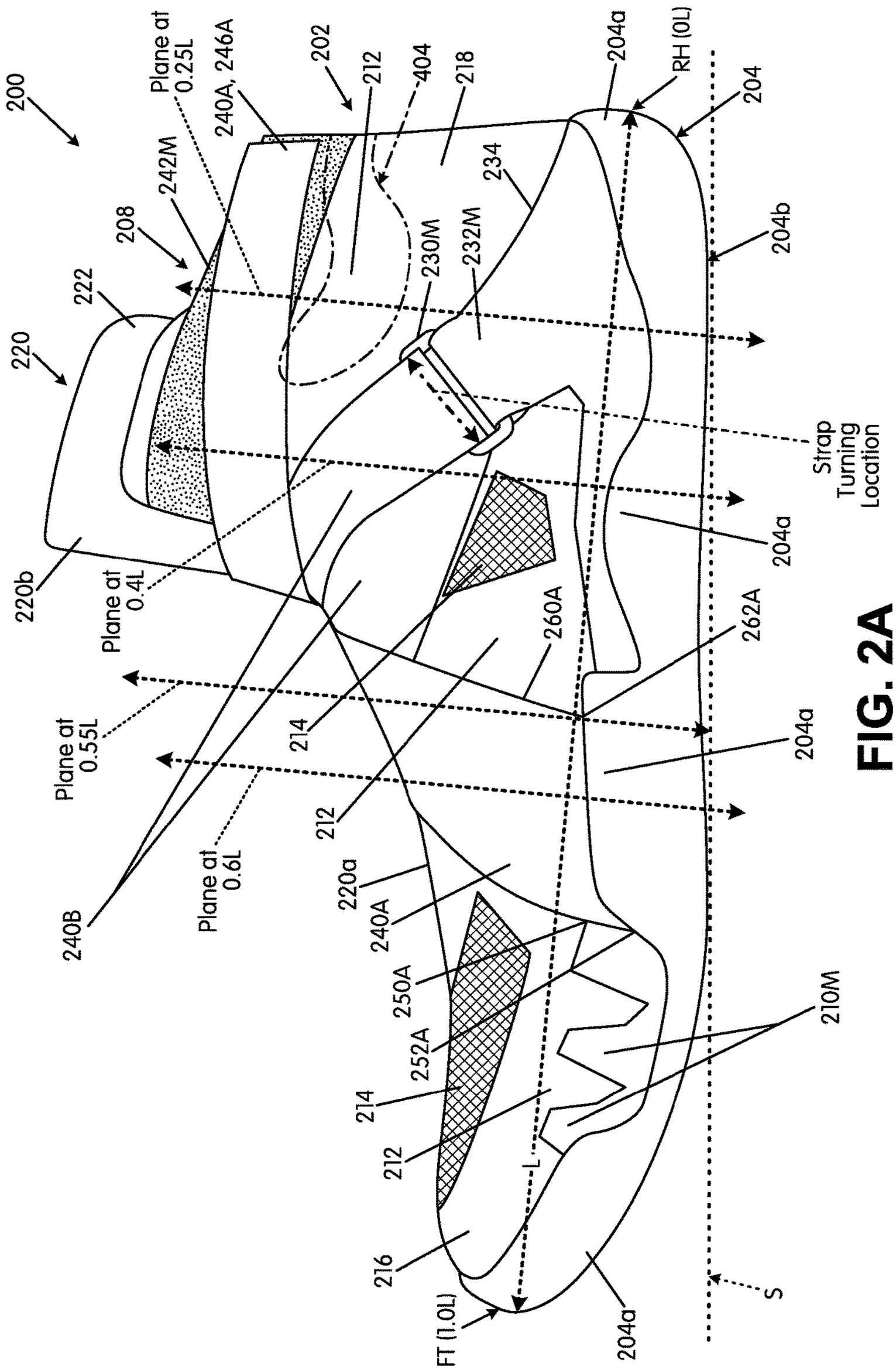
S
0.8L
Transverse Direction
0.6L
0.55L
0.5L
0.4L
0.25L
Rearward Direction
Longitudinal Length L
Forward Direction
Medial Side
Lateral Side
VP
RH (0L)

FIG. 1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240A, 246A
202
212
404
218
204a
RH (0L)
204
242M
208
234
232M
230M
204b
222
220
Strap Turning Location
220b
Plane at 0.4L
260A
262A
204a
Plane at 0.55L
214
212
Plane at 0.6L
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214
212
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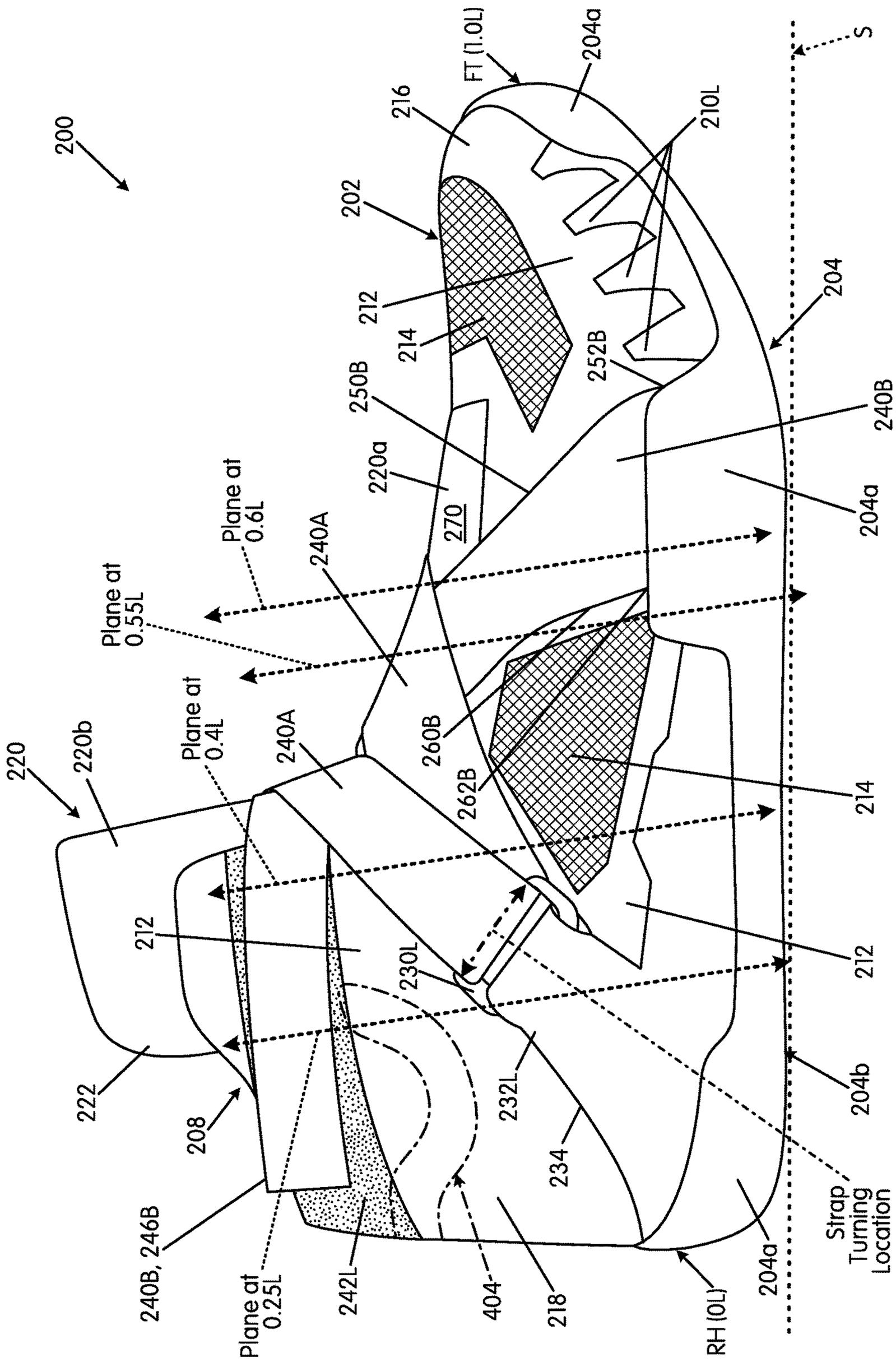
L
216
FT (1.0L)
204a
S

FIG. 2A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404
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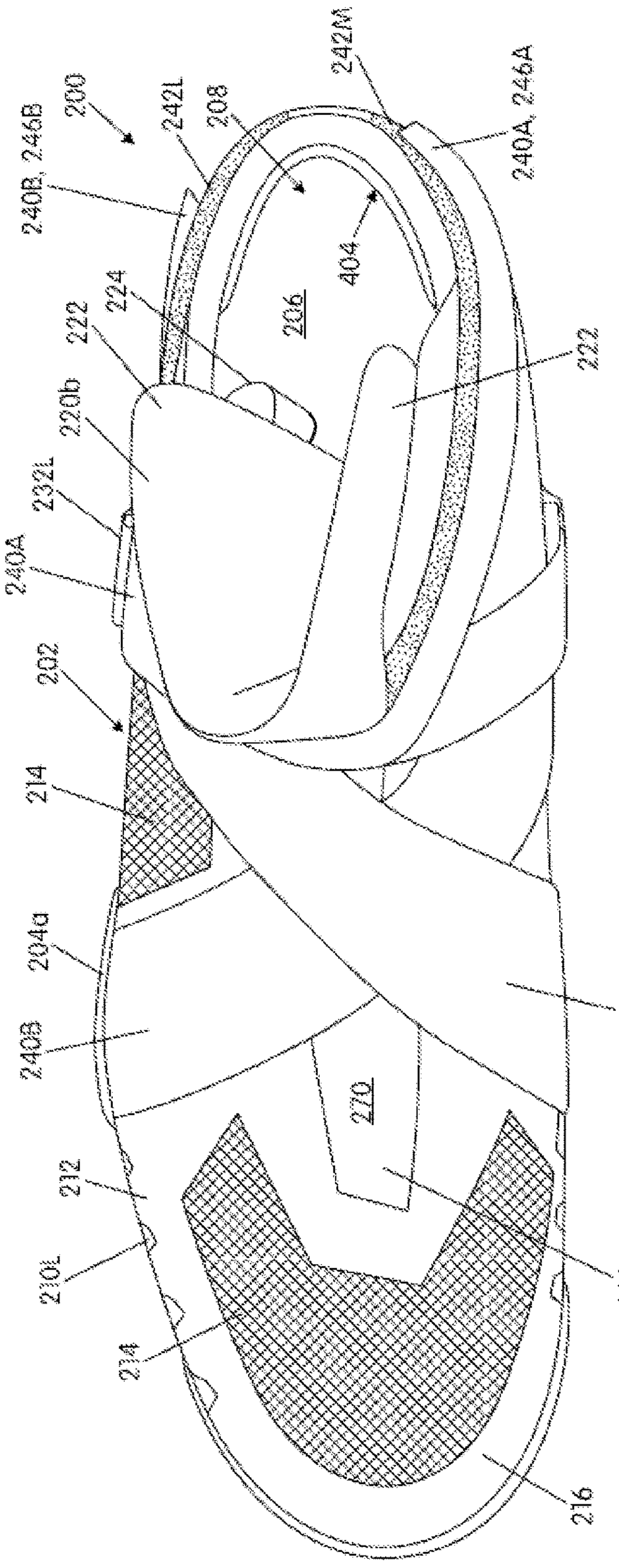
204a
Strap Turning Location
204b
232L
234
230L
212
Plane at 0.4L
240A
Plane at 0.55L
Plane at 0.6L
260B
262B
214
212
270
220a
250B
214
212
216
FT (1.0L)
204a
210L
202
252B
240B
204a
204
S

FIG. 2B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242L
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206
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222
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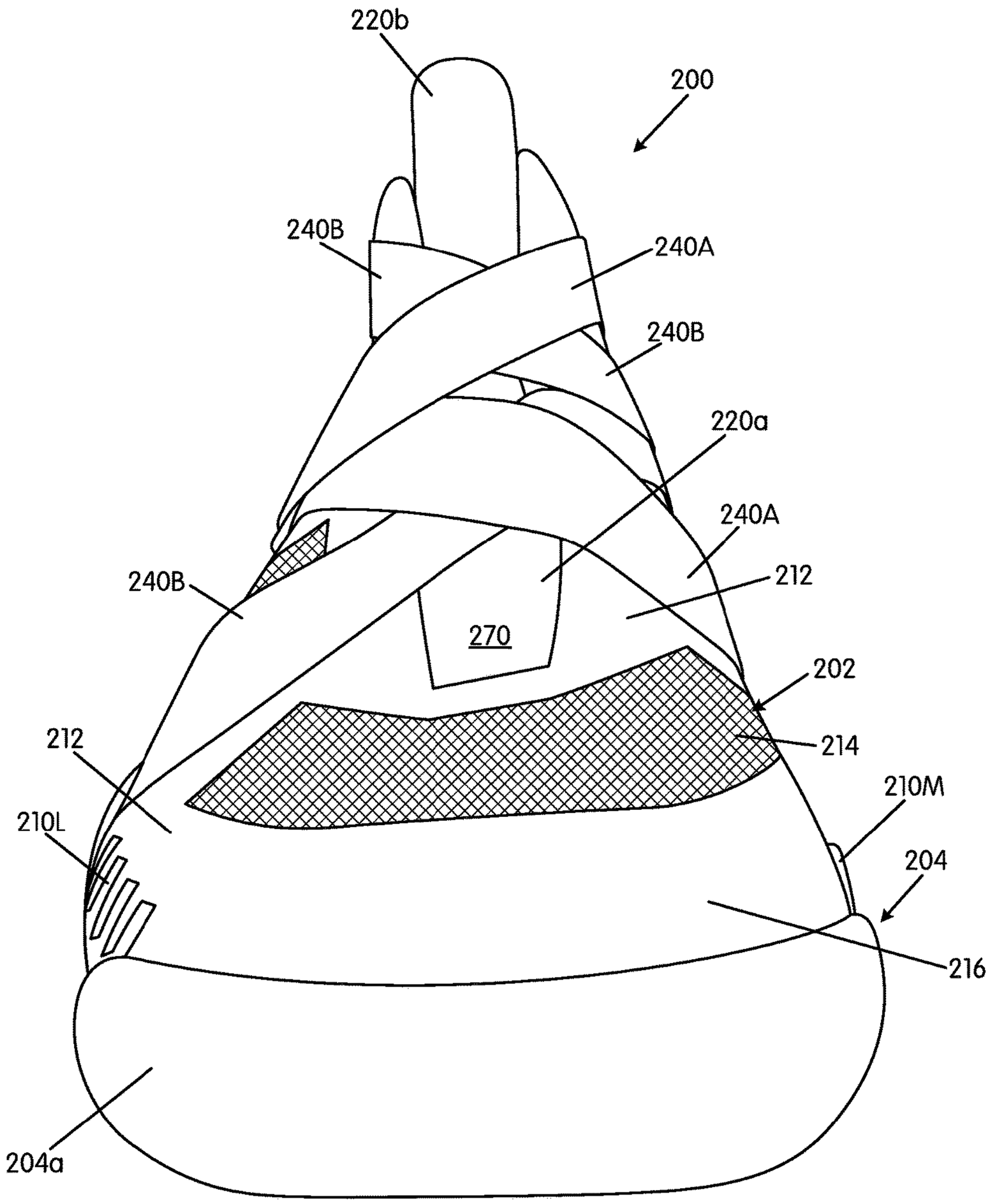
240A
202
214
204a
240B
270
212
210L
224
220a
216

FIG. 2C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240A
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220a
240A
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212
270
202
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210M
210L
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216
204a

FIG. 2D

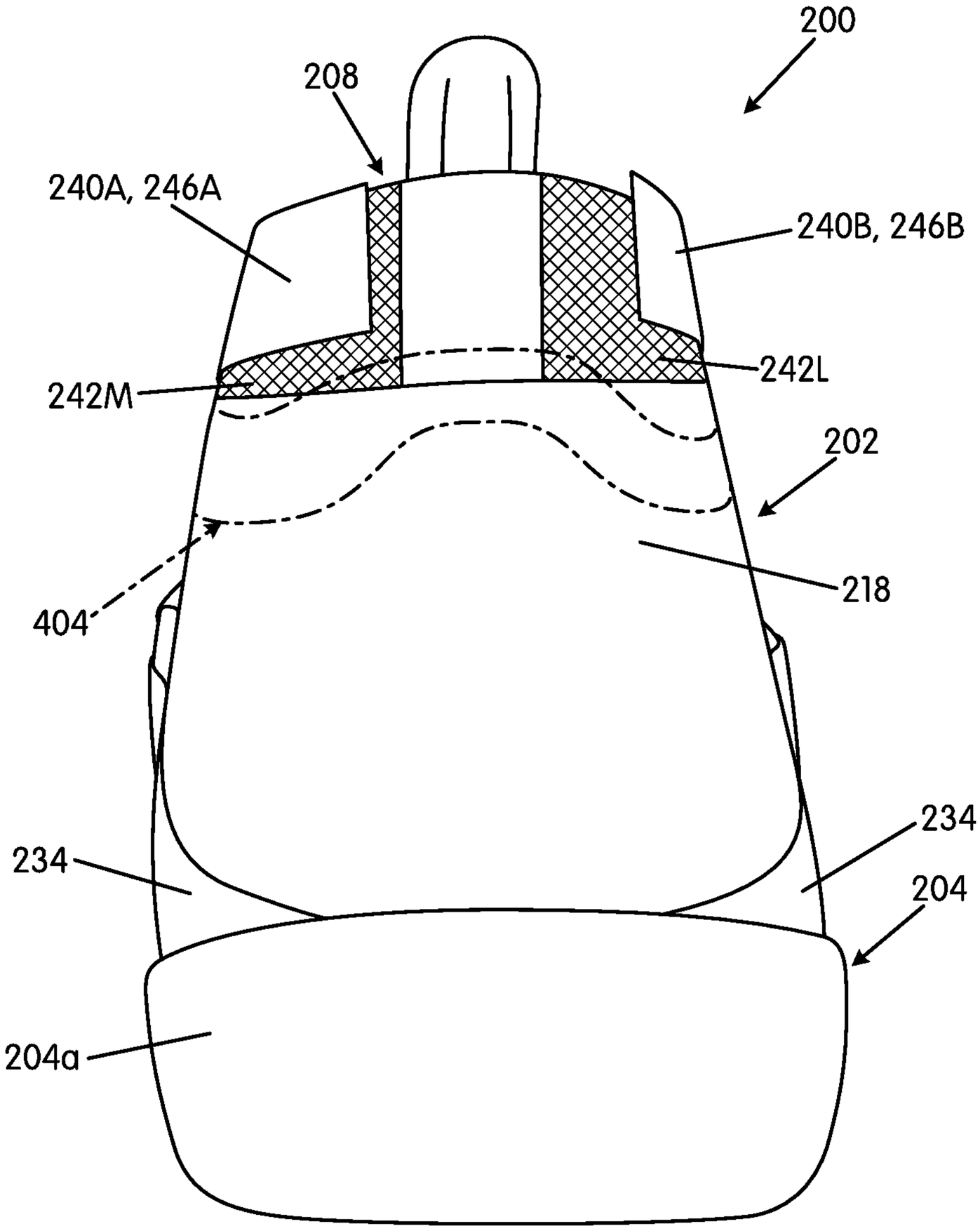
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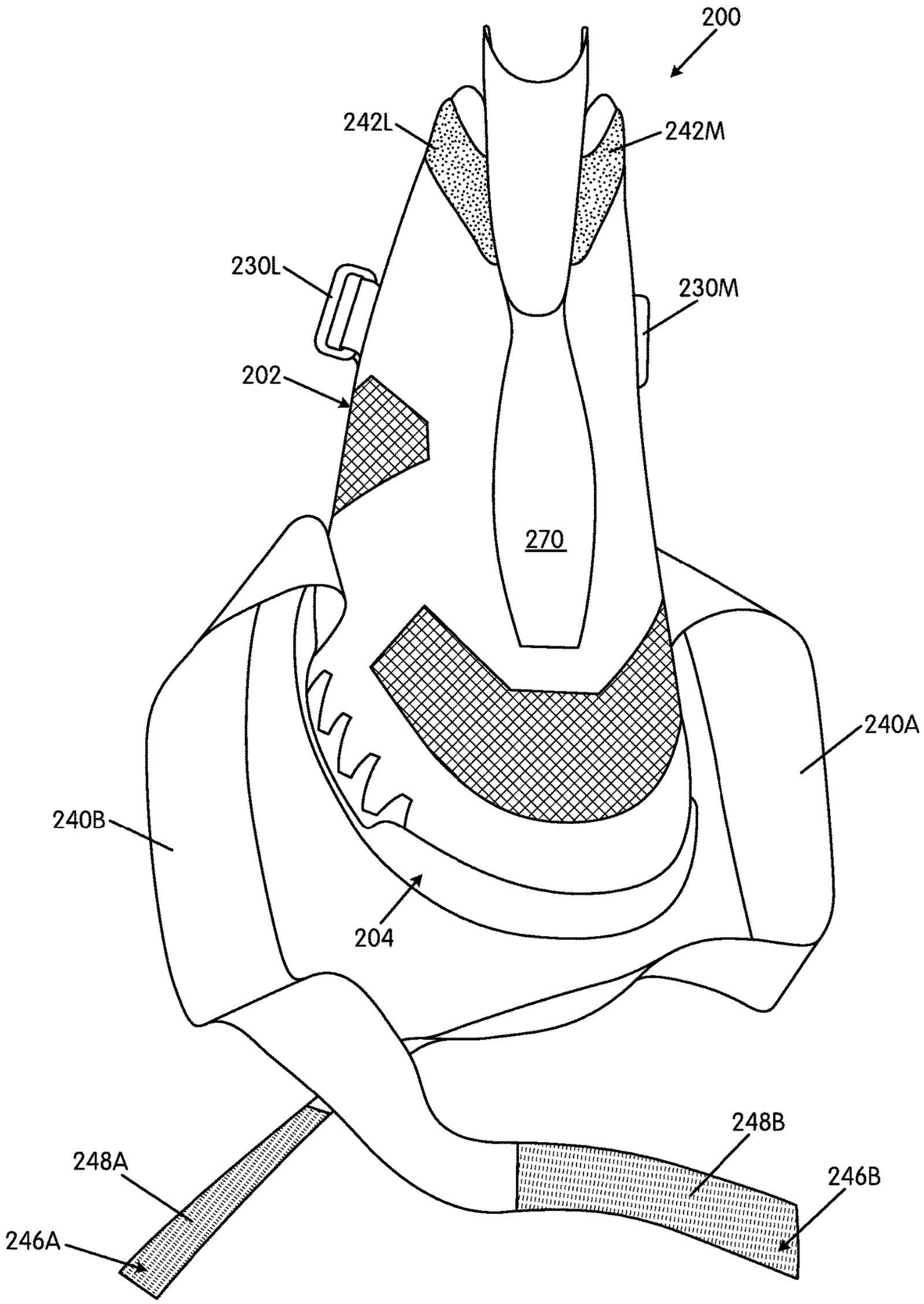
FIG. 2E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270
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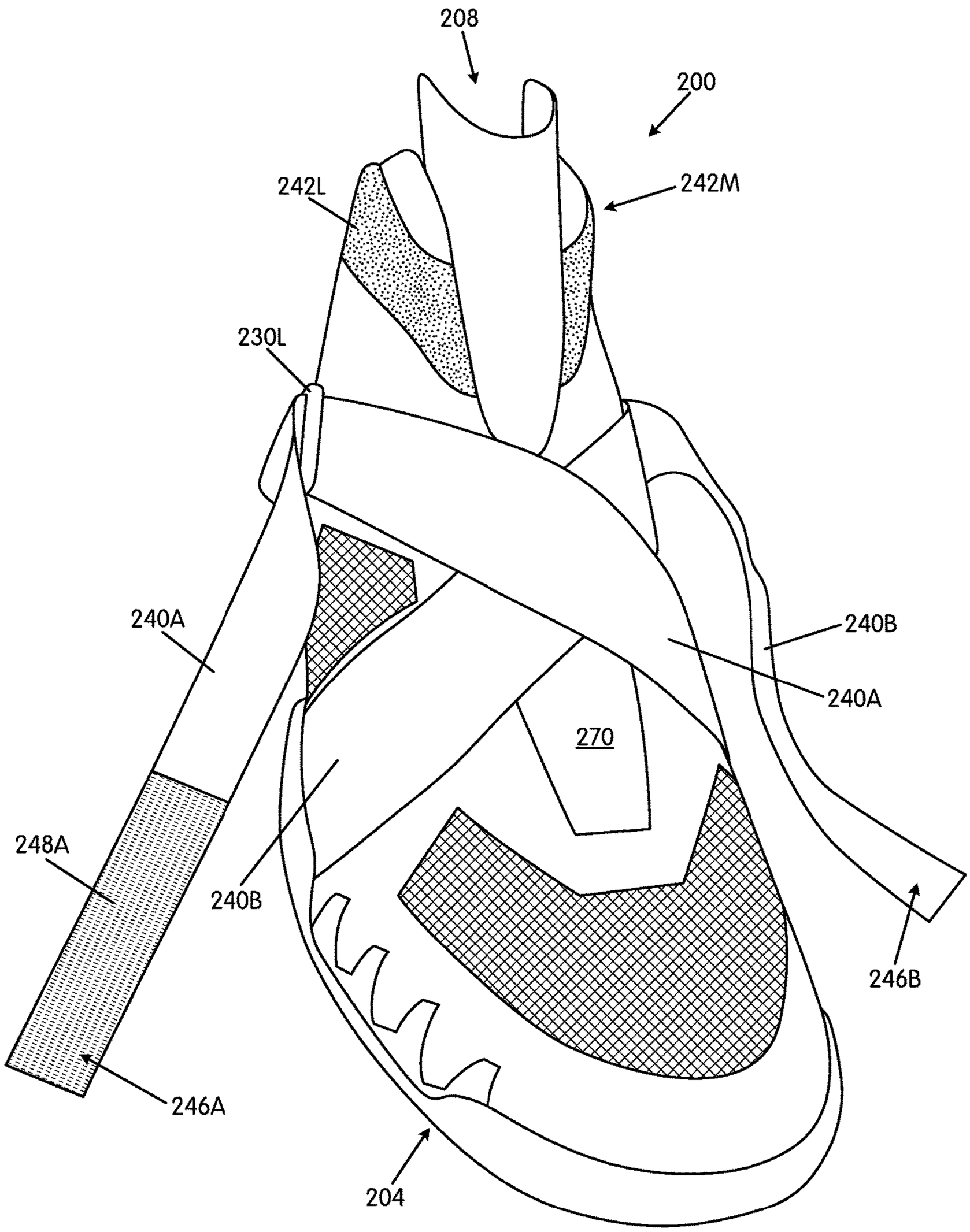
240B
204
248B
248A
246B
246A

FIG. 2F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200
242L
242M
230L
240A
240B
240A
270
248A
240B
246B
246A
204

FIG. 2G

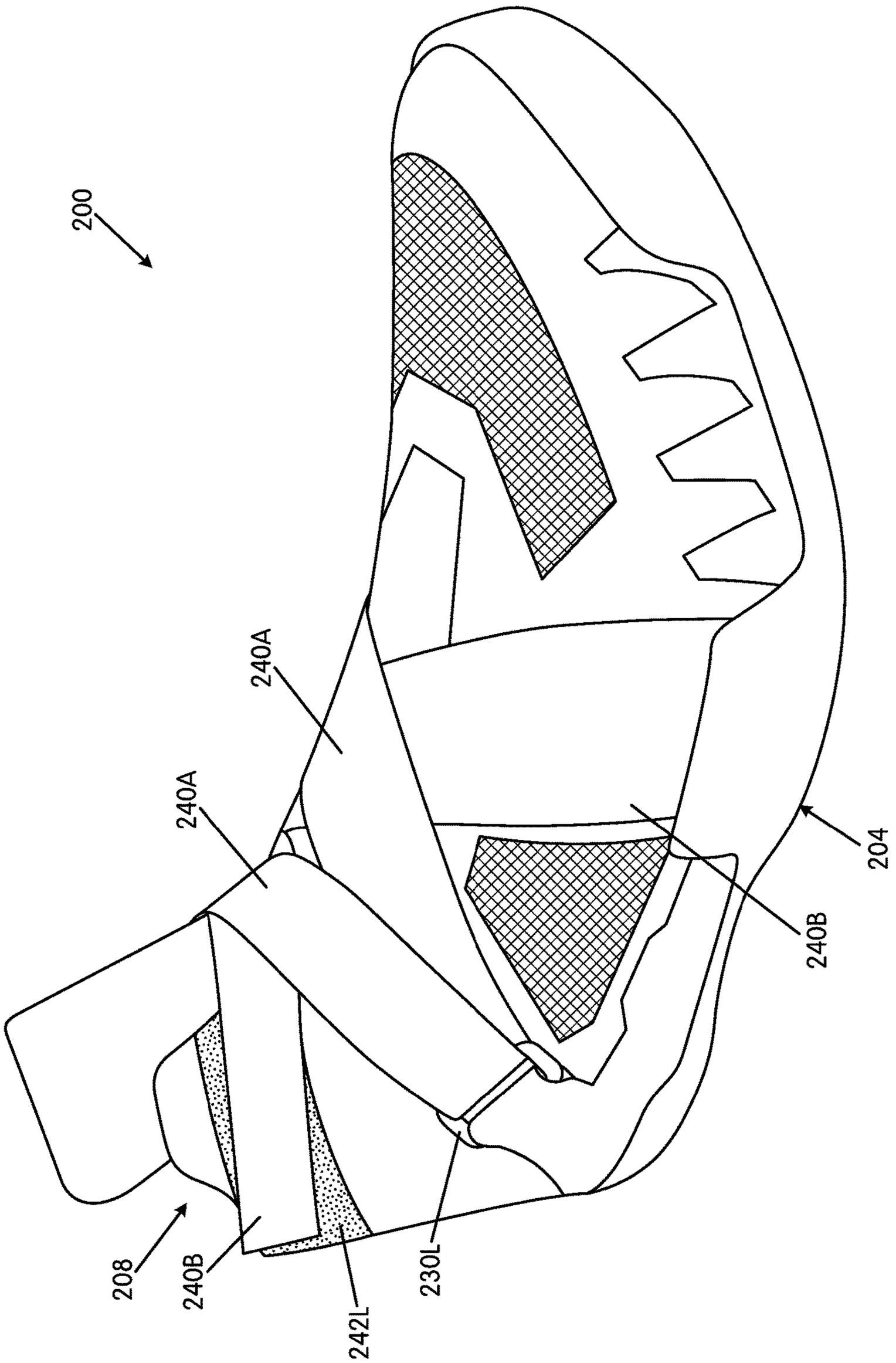


FIG. 2H

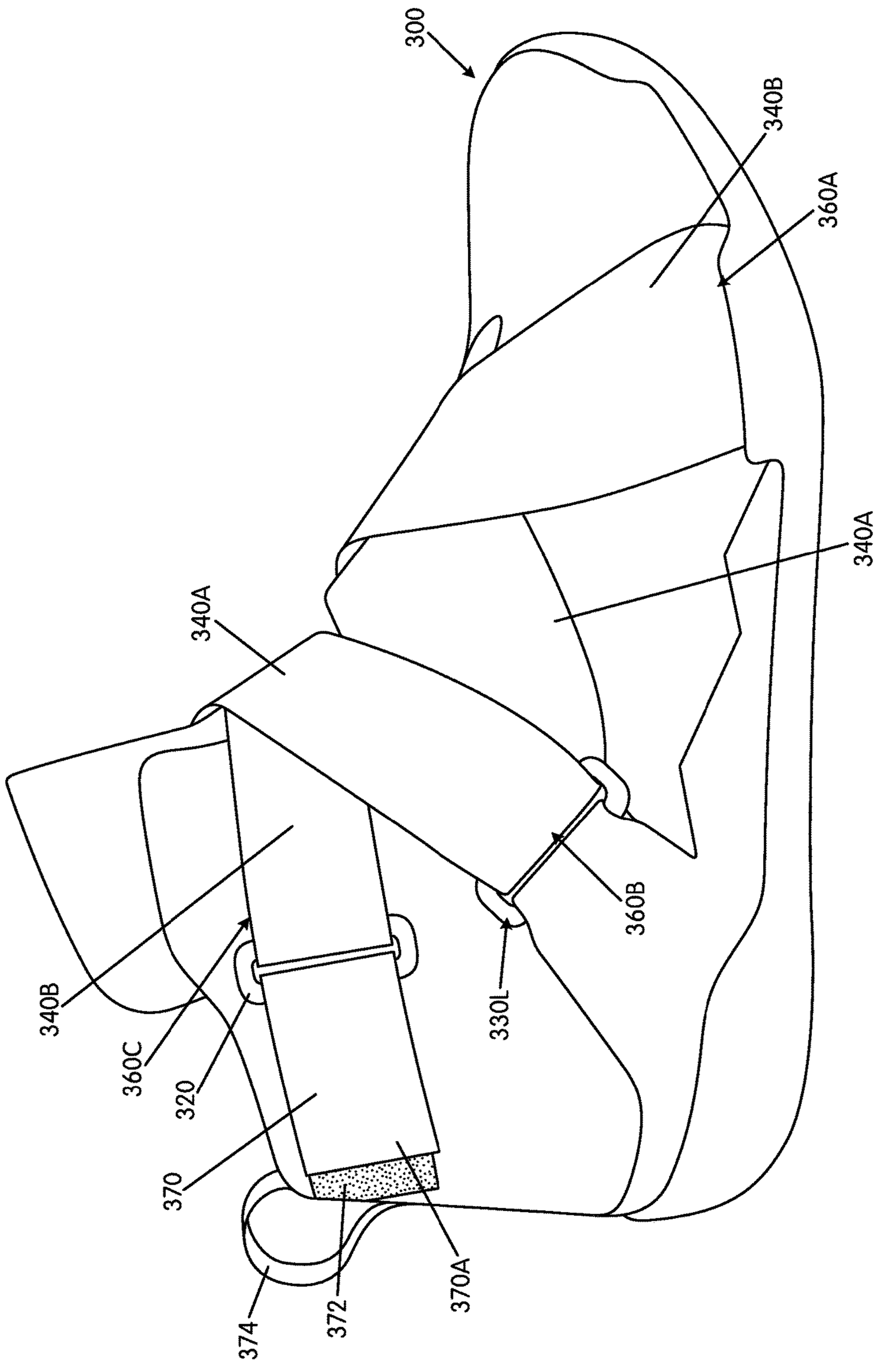
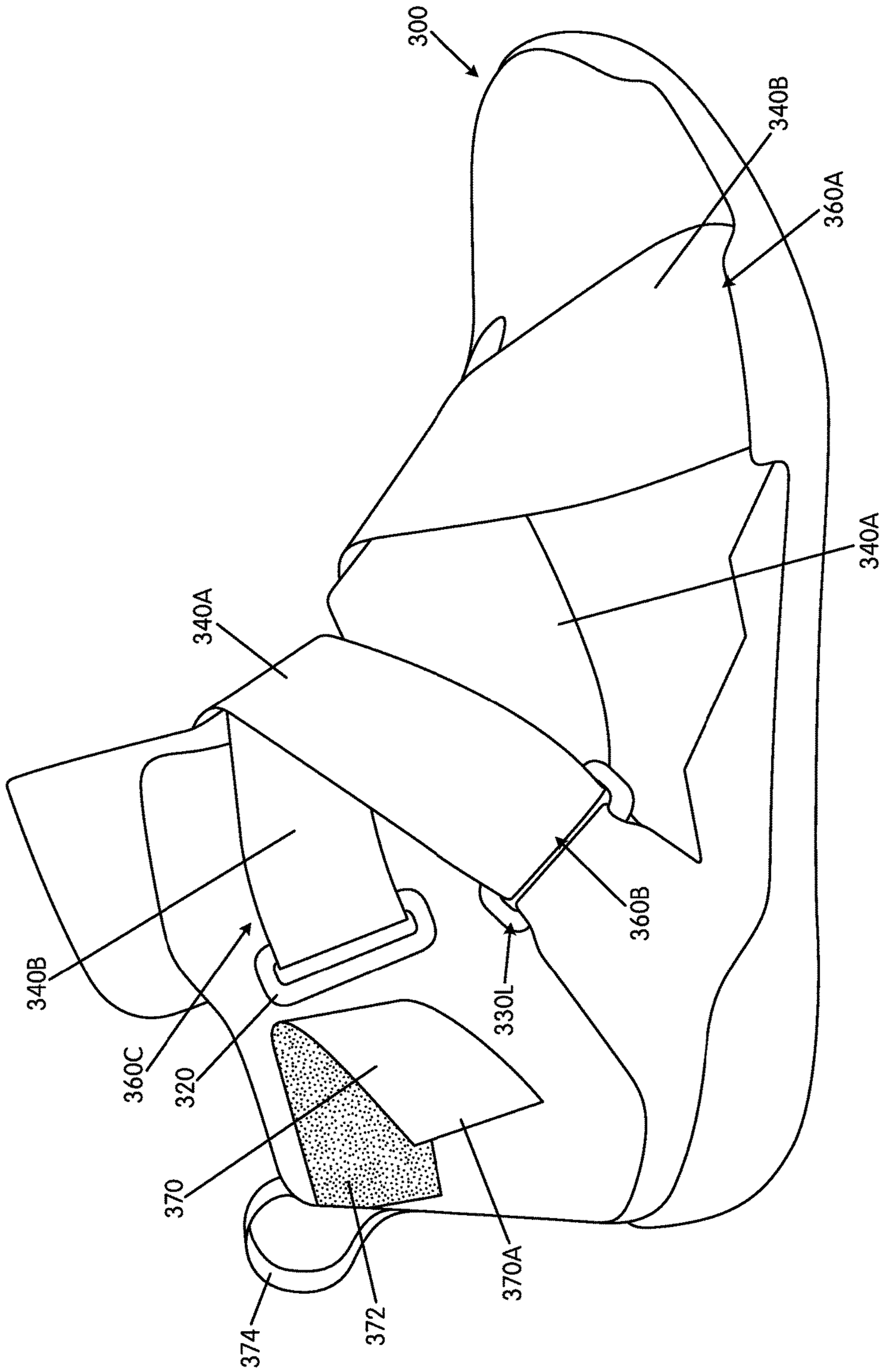

300
340B
360A
340A
340A
330L
360B
340B
360C
320
370
374
372
370A

FIG. 3A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340B
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360C
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370
370A
374
372

FIG. 3B

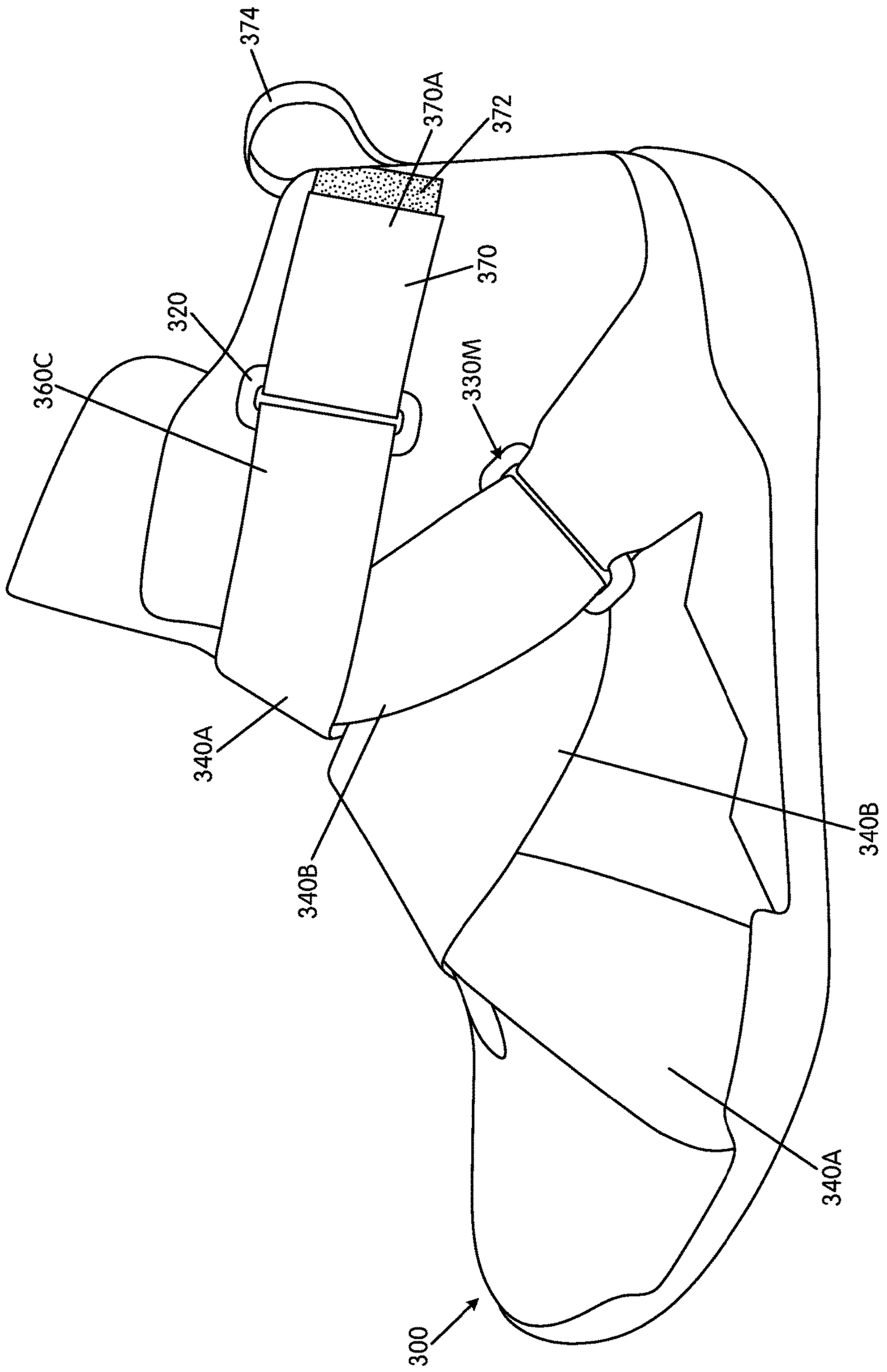

FIG. 3C

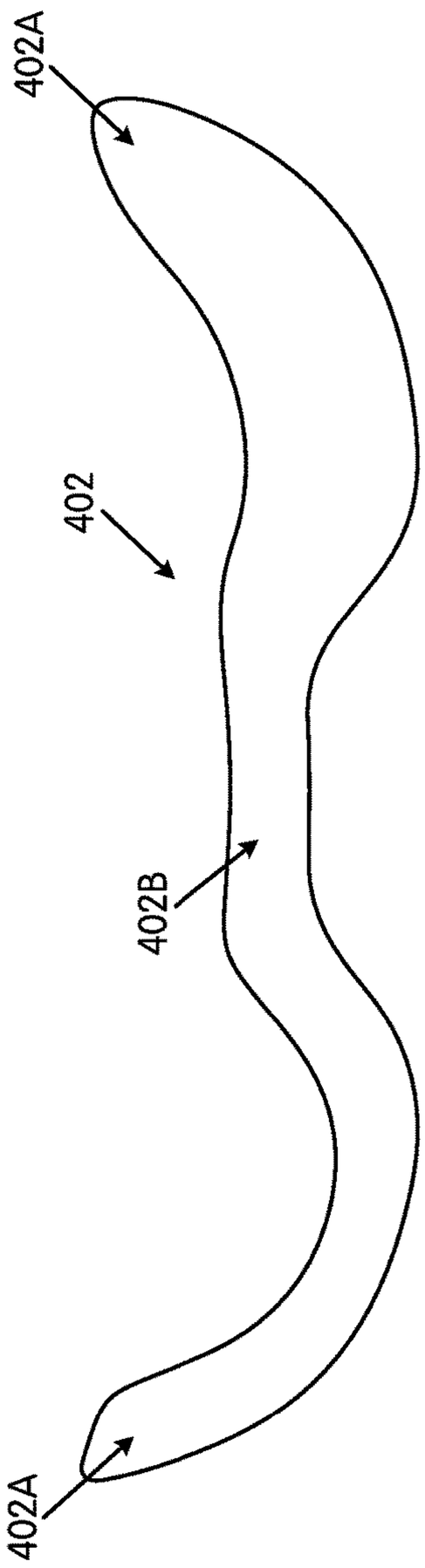

FIG. 4A

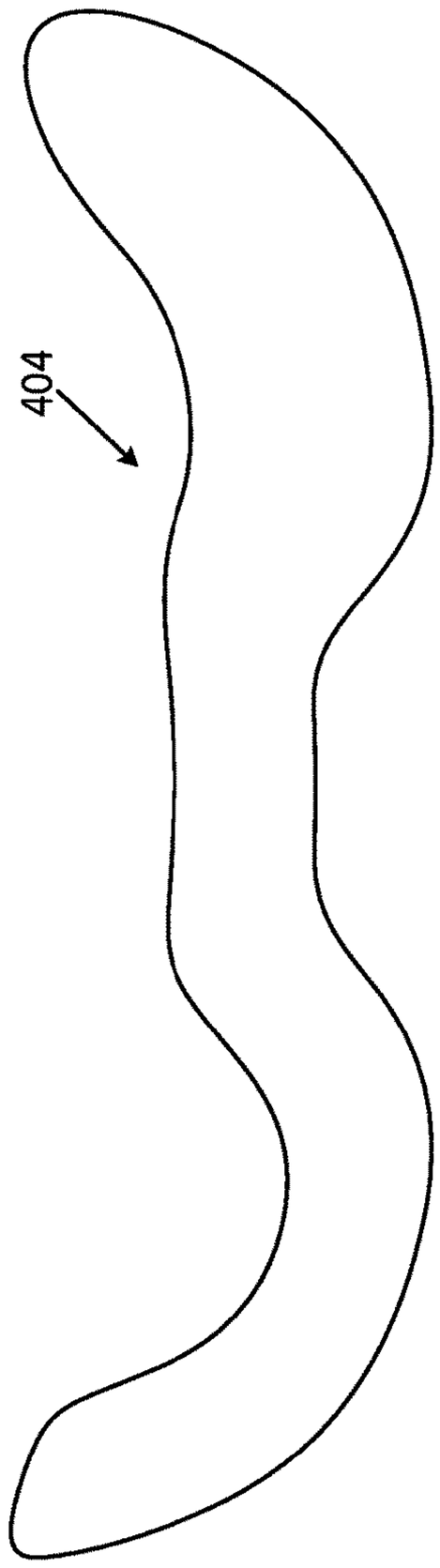

FIG. 4B

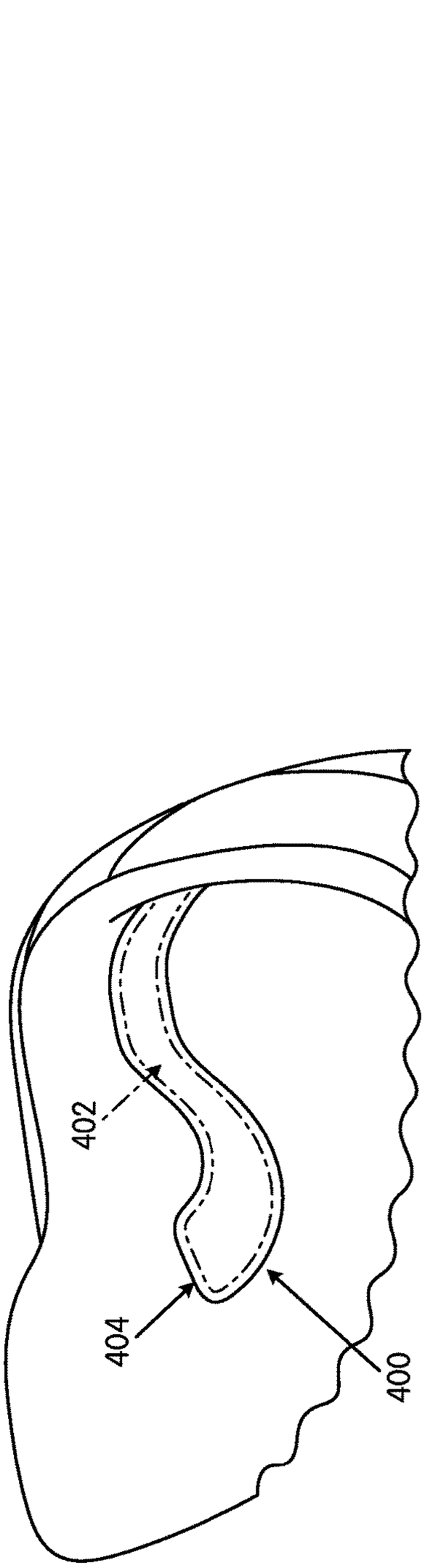

FIG. 4C

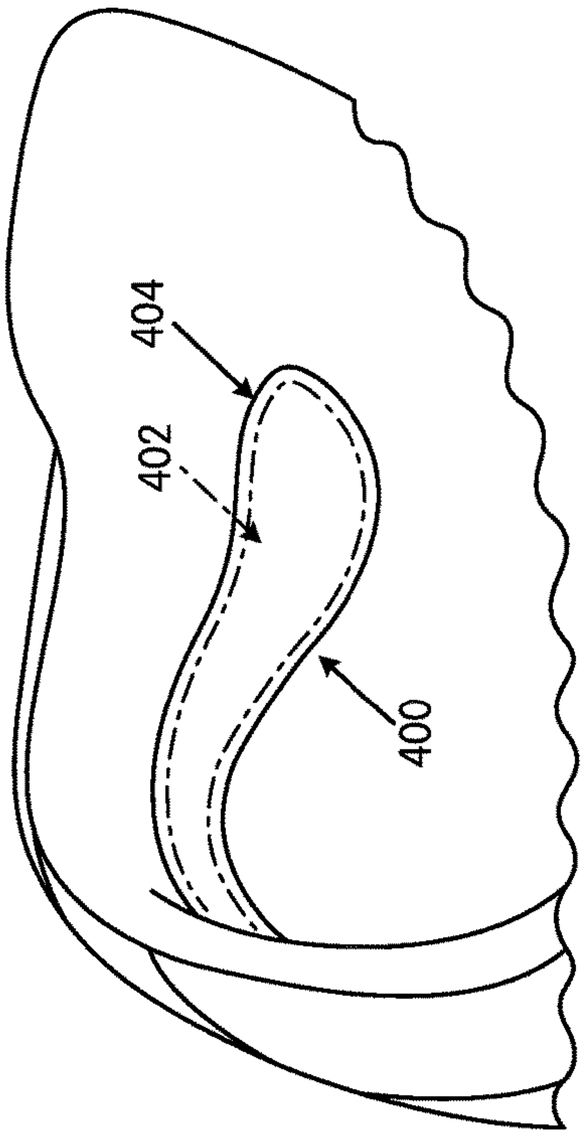

FIG. 4D

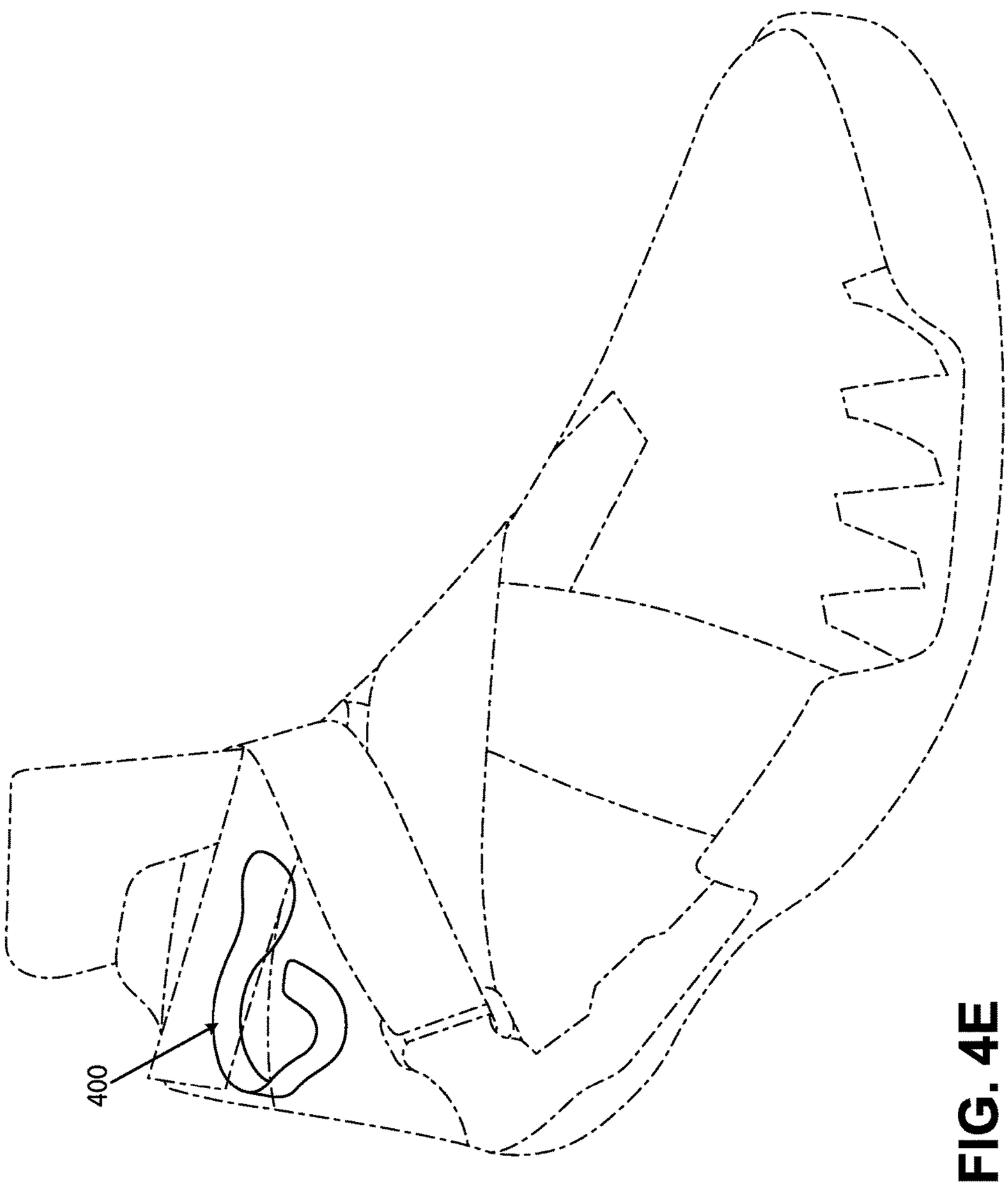

FIG. 4E

STRAP SECURING SYSTEMS FOR ARTICLES OF FOOTWEAR AND OTHER FOOT-RECEIVING DEVICES

FIELD OF THE INVENTION

The present invention relates to the field of footwear and other foot-receiving devices. More specifically, aspects of the present invention pertain to securing systems for articles of footwear and other foot-receiving devices that include crossing strap members.

BACKGROUND

Conventional articles of athletic footwear include two primary elements, an upper and a sole structure. The upper provides a covering for the foot that securely receives and positions the foot with respect to the sole structure. In addition, the upper may have a configuration that protects the foot and provides ventilation, thereby cooling the foot and removing perspiration. The sole structure is secured to a lower surface of the upper and is generally positioned between the foot and any contact surface. In addition to attenuating ground reaction forces and absorbing energy, the sole structure may provide traction and control potentially harmful foot motion, such as over pronation. General features and configurations of uppers and sole structures are discussed in greater detail below.

The upper forms a void on the interior of the footwear for receiving the foot. The void has the general shape of the foot, and access to the void is provided at an ankle or foot-insertion opening. Accordingly, the upper extends over the instep and toe areas of the foot, along the medial and lateral sides of the foot, and around the heel area of the foot. A lacing system often is incorporated into the upper to selectively change the size of the ankle opening and to permit the wearer to modify certain dimensions of the upper, particularly girth, to accommodate feet with varying proportions. In addition, the upper may include a tongue that extends under the lacing system to enhance the comfort of the footwear (e.g., to modulate pressure applied to the foot by the laces), and the upper also may include a heel counter to limit or control movement of the heel.

The sole structure generally incorporates multiple layers that are conventionally referred to as an "insole," a "midsole," and an "outsole." The insole (which also may constitute a sock liner) is a thin member located within the upper and adjacent the plantar (lower) surface of the foot to enhance footwear comfort, e.g., to wick away moisture. The midsole, which is traditionally attached to the upper along the upper's entire length, forms the middle layer of the sole structure and serves a variety of purposes that include controlling foot motions and attenuating impact forces. The outsole forms the ground-contacting element of footwear and usually is fashioned from a durable, wear-resistant material that includes texturing or other features to improve traction.

The primary element of a conventional midsole is a resilient, polymer foam material, such as polyurethane or ethylvinylacetate ("EVA"), that extends throughout the length of the footwear. The properties of the polymer foam material in the midsole are primarily dependent upon factors that include the dimensional configuration of the midsole and the specific characteristics of the material selected for the polymer foam, including the density of the polymer foam material. By varying these factors throughout the midsole, the relative stiffness, the degree of ground reaction force attenuation, and the energy absorption properties may be altered to meet the specific demands of the activity for which the footwear is intended to be used.

Terminology/General Information

First, some general terminology and information is provided that will assist in understanding various portions of this specification and the invention(s) as described herein. As noted above, the present invention relates to the field of footwear and other foot-receiving devices, including securing systems for such devices. "Foot-receiving device" means any device into which a user places at least some portion of his or her foot. In addition to all types of footwear (described below), foot-receiving devices include, but are not limited to: bindings and other devices for securing feet in snow skis, cross country skis, water skis, snowboards, and the like; bindings, clips, or other devices for securing feet in pedals for use with bicycles, exercise equipment, and the like; bindings, clips, or other devices for receiving feet during play of video games or other games; and the like. "Foot-receiving devices" may include one or more "foot-covering members" (e.g., akin to footwear upper components), which help position the foot with respect to other components or structures and one or more "foot-supporting members" (e.g., akin to footwear sole structure components), which support at least some portion(s) of a plantar surface of a user's foot. "Securing systems," like those in accordance with at least some aspects of this invention, may help position and/or securely hold the user's foot in place with respect to the foot-covering member(s) and/or the foot-supporting member(s). "Footwear" means any type of wearing apparel for the feet, and this term includes, but is not limited to: all types of shoes, boots, sneakers, sandals, thongs, flip-flops, mules, scuffs, slippers, sport-specific shoes (such as golf shoes, tennis shoes, baseball cleats, soccer or football cleats, ski boots, basketball shoes, cross training shoes, etc.), and the like. "Foot-supporting members" may include components for and/or functioning as midsoles and/or outsoles for articles of footwear (or components providing corresponding functions in non-footwear type foot-receiving devices).

FIG. **1** also provides information that may be useful for explaining and understanding the specification and/or aspects of this invention. More specifically, FIG. **1** provides a representation of a footwear/foot-receiving device component **100**, which in this illustrated example constitutes a portion of a sole structure for an article of footwear. The same general definitions and terminology described below may apply to footwear and foot-receiving devices in general and/or to other footwear/foot-receiving device components or portions thereof, such as an upper, a midsole component, an outsole component, etc.

First, as illustrated in FIG. **1**, the terms "forward" or "forward direction" as used herein, unless otherwise noted or clear from the context, mean toward or in a direction toward a forward-most toe area of the footwear or foot-receiving device structure or component **100**. The terms "rearward" or "rearward direction" as used herein, unless otherwise noted or clear from the context, mean toward or in a direction toward a rear-most heel area of the footwear or foot-receiving device structure or component **100**. The terms "lateral" or "lateral side" as used herein, unless otherwise noted or clear from the context, mean the outside or "little toe" side of the footwear or foot-receiving device structure or component **100**. The terms "medial" or "medial side" as used herein, unless otherwise noted or clear from

the context, mean the inside or "big toe" side of the footwear or foot-receiving device structure or component **100**.

Also, various example features and aspects of this invention are disclosed or explained herein with reference to a "longitudinal direction" and/or with respect to a "longitudinal length" of a footwear/foot-receiving device component **100** (such as a footwear sole structure). As shown in FIG. **1**, the "longitudinal direction" is determined as the direction of a line extending from a rearmost heel location (RH in FIG. **1**) to the forwardmost toe location (FT in FIG. **1**) of the footwear component **100** in question (a sole structure or foot-supporting member in this illustrated example). The "longitudinal length" L is the length dimension measured from the rearmost heel location RH to the forwardmost toe location FT. The rearmost heel location RH and the forwardmost toe location FT may be located by determining the rear heel and forward toe tangent points with respect to front and back parallel vertical planes VP when the component **100** (e.g., sole structure or foot-supporting member in this illustrated example, optionally as part of an article of footwear or foot-receiving device) is oriented on a horizontal support surface S in an unloaded condition (e.g., with no weight applied to it other than potentially the weight of the shoe/foot-receiving device components with which it is engaged). If the forwardmost and/or rearmost locations of a specific footwear or foot-receiving device component **100** constitute a line segment (rather than a tangent point), then the forwardmost toe location and/or the rearmost heel location constitute the mid-point of the corresponding line segment. If the forwardmost and/or rearmost locations of a specific footwear or foot-receiving device component **100** constitute two or more separated points or line segments, then the forwardmost toe location and/or the rearmost heel location constitute the mid-point of a line segment connecting the furthest spaced and separated points and/or furthest spaced and separated end points of the line segments (irrespective of whether the midpoint itself lies on the component **100** structure). If the forwardmost and/or rearwardmost locations constitute one or more areas, then the forwardmost toe location and/or the rearwardmost heel location constitute the geographic center of the area or combined areas (irrespective of whether the geographic center itself lies on the component **100** structure).

Once the longitudinal direction of a component or structure **100** has been determined with the component **100** oriented on a horizontal support surface S, planes may be oriented perpendicular to this longitudinal direction (e.g., planes running into and out of the page of FIG. **1**). The locations of these perpendicular planes may be specified based on their positions along the longitudinal length L where the perpendicular plane intersects the longitudinal direction between the rearmost heel location RH and the forwardmost toe location FT. In this illustrated example of FIG. **1**, the rearmost heel location RH is considered as the origin for measurements (or the "0L position") and the forwardmost toe location FT is considered the end of the longitudinal length of this component (or the "1.0L position"). Plane position may be specified based on its location along the longitudinal length L (between 0L and 1.0L), measured forward from the rearmost heel RH location in this example. FIG. **1** further shows locations of various planes perpendicular to the longitudinal direction (and oriented in the transverse direction) and located along the longitudinal length L at positions 0.25L, 0.4L, 0.5L, 0.55L, 0.6L, and 0.8L (measured in a forward direction from the rearmost heel location RH). These planes may extend into and out of the page of the paper from the view shown in FIG. **1**, and similar planes may be oriented at any other desired positions along the longitudinal length L. While these planes may be parallel to the parallel vertical planes VP used to determine the rearmost heel RH and forwardmost toe FT locations, this is not a requirement. Rather, the orientations of the perpendicular planes along the longitudinal length L will depend on the orientation of the longitudinal direction, which may or may not be parallel to the horizontal surface S in the arrangement/orientation shown in FIG. **1**.

The terms "strap" and "strap portions" as used herein, unless otherwise noted, mean a band of material having: (a) a substantially greater width dimension ("W") than a thickness dimension ("T") and (b) a substantially greater length dimension ("L") than width dimension. As some more specific examples, "straps" or "strap portions" in accordance with at least some examples of this invention will have one or more of: (a) a width dimension to thickness dimension ratio ("W/T") over at least 75% of its longitudinal length of at least 5, (b) an absolute width dimension W of at least 10 mm over at least 75% of its length L, (c) an absolute thickness dimension T of less than 3 mm over at least 75% of its length L, and/or (d) an absolute length dimension L of at least 2.5 times its widest width dimension over that length. A "strap" or "strap portion" may be connected to or integrally formed with another element or component that is not a "strap" or "strap portion."

As some more specific examples, "straps" or "strap portions" in accordance with at least some examples of this invention may have one or more of:

a. a W/T ratio over at least 75% of the strap's length of at least 7.5, at least 10, at least 15, at least 20, or at least 25; in some examples, these W/T ratio ranges will be provided over at least 85%, at least 90%, at least 95%, or even over 100% of the strap's length;
b. a W/T ratio over at least 75% of strap's length in a range of 5 to 50, in a range of 7.5 to 48, or in a range of 10 to 45; in some examples, these W/T ratio ranges will be provided over at least 85%, at least 90%, at least 95%, or even over 100% of the strap's length;
c. an absolute thickness dimension of less than 2.5 mm or less than 2 mm over at least 75% of the strap's length; in some examples, these thickness dimension ranges will be provided over at least 85%, at least 90%, at least 95%, or even over 100% of the strap's length;
d. an absolute width dimension over at least 75% of the strap's length of at least 15 mm or at least 18 mm; in some examples, these width dimension ranges will be provided over at least 85%, at least 90%, at least 95%, or even over 100% of the strap's length;
e. an absolute width dimension over at least 75% of the strap's length within a range from 10 to 75 mm, and in some examples, within a range from 15 to 65 mm or within a range from 18 to 60 mm; in some examples, these absolute strap width dimension ranges will be provided over at least 85%, at least 90%, at least 95%, or even over 100% of the strap's length;
f. an absolute strap length of at least 3 times or at least 5 times the strap's widest width dimension over that length;
g. an absolute width dimension that varies over the strap's length, e.g., tapers, stepwise changes, or otherwise varies in width from wider to narrower or vice versa (e.g., having a width of 40 to 60 mm at locations where engaged with and/or emerging from a sole structure and a width of 15 to 25 mm at its free end); and/or

h. an absolute thickness dimension that varies over its length and/or width, e.g., tapers, stepwise changes, or otherwise varies in thickness from thicker to thinner or vice versa).

For determining the W/T ratios as described above, the width and thickness dimensions are measured at a common location on the strap structure. The strap's length dimension L may be measured as the dimension from: (a) a location where one end of the strap is fixed to the upper or sole structure (e.g., where the strap emerges from a location between the upper and the sole structure) and (b) a free end of the strap. The strap's thickness dimension T at a given point is measured as the direct distance (shortest distance) between a first major surface and a second major surface of the strap at that point. The strap's width dimension W at a given point is measured as the direct distance (shortest distance) from one side edge of the strap to its opposite side edge at that point. These measurements are made with the strap or strap portion held taut but not under a substantial tensile force (e.g., less than 0.1 kg tensile force).

While straps or strap portions may be stretchable or unstretchable, in the illustrated examples, the strap portions are unstretchable. The terms "not stretchable" or "unstretchable," as used herein in this context, mean that the strap or strap portion stretches less than 5% of its unloaded longitudinal length under a tensile force of 10 kg.

SUMMARY

This Summary is provided to introduce some concepts relating to this invention in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the invention.

While potentially useful for any desired types or styles of shoes or foot-receiving devices, aspects of this invention may be of particular interest for athletic shoes, including basketball shoes (e.g., high top basketball shoes).

Some aspects of this invention relate to articles of footwear (or other foot-receiving devices) that include:

(A) an upper (or other foot-covering member) defining a foot-insertion opening, a lateral ankle side, a medial ankle side, and an instep area (forward of the foot-insertion opening), wherein the upper includes: (i) a medial strap tensioning component located on the medial ankle side, and (ii) a lateral strap tensioning component located on the lateral ankle side;

(B) a sole structure (or other foot-supporting member) engaged with the upper (or foot-covering member), optionally engaged such that junctions between these elements may be located at a medial edge and/or a lateral edge of the article of footwear/foot-receiving device; and

(C) a securing system engaged with the upper/foot-covering member, wherein the securing system includes: (i) a first strap portion extending across the instep area, engaging the lateral strap tensioning component, extending in front of the foot-insertion opening, and extending to the medial ankle side, and (ii) a second strap portion extending across the instep area, engaging the medial strap tensioning component, extending in front of the foot-insertion opening, and extending to the lateral ankle side,

wherein the first and second strap portions cross one another at two separated crossing locations (one crossing location located forward of the other crossing location). The upper/foot-covering member further may include a medial strap securing component (e.g., a hook-and-loop fastener or other type of fastener) located on the medial side of the foot-insertion opening (e.g., between the foot-insertion opening and the medial strap tensioning component) for securing the first strap portion and/or a lateral strap securing component (e.g., a hook-and-loop fastener or other type of fastener) located on the lateral side of the foot-insertion opening (e.g., between the foot-insertion opening and the lateral strap tensioning component) for securing the second strap portion.

If desired, the medial strap tensioning component and/or the lateral strap tensioning component may be engaged with a heel reinforcement component, such as a heel counter or other relatively stiff or heavy fabric, textile, or plastic material, that extends around a rear heel area of the upper/foot-covering member. The strap tensioning component(s) may be mounted on straps or other elements that extend from the heel reinforcement component and/or are otherwise mounted to a component of the footwear/foot-receiving device structure.

The first strap portion and the second strap portion may be provided as independent and separate strap components or they may be opposite sides of a single strap member or other component (e.g., a component that extends beneath a plantar support surface between the upper/foot-covering member and the sole structure/foot-supporting member from the lateral side edge to the medial side edge). While other constructions are possible, the first strap portion may be fixedly engaged between the upper/foot-covering member and the sole structure/foot-supporting member at a first strap engagement or emerging location located forward of the first strap crossing location, and the second strap portion may be fixedly engaged between the upper/foot-covering member and the sole structure/foot-supporting member at a second strap engagement or emerging location located forward of the first strap crossing location.

At least some example articles of footwear/foot-receiving devices according to aspects of this invention may include one or more of the following constructions and/or orientations when a bottom surface of the sole structure/foot-supporting member rests on a horizontal surface:

(a) the sole structure/foot-supporting member defines a longitudinal direction and a longitudinal length L from a rearmost heel location to a forwardmost toe location;

(b) a forward edge of the first strap portion meets the sole structure/foot-supporting member at the medial edge of the footwear/foot-receiving device structure at a first location forward of a plane perpendicular to the longitudinal direction and located at a position 0.6L along the longitudinal direction, measured forward from the rearmost heel location (and in some examples, forward of planes at 0.55L, 0.65L, or 0.7L);

(c) a forward edge of the second strap portion meets the sole structure/foot-supporting member at the lateral edge of the footwear/foot-receiving device structure at a second location forward of the plane located at position 0.6L (and in some examples, forward of planes at 0.55L, 0.65L, or 0.7L);

(d) a rear edge of the first strap portion meets the sole structure/foot-supporting member at the medial edge of the footwear/foot-receiving device structure at a first location forward of a plane perpendicular to the longitudinal direction and located at a position 0.55L along the longitudinal direction, measured forward from the rearmost heel location (and in some examples, forward of planes at 0.5L, 0.6L, or 0.65L); and/or

(e) a rear edge of the second strap portion meets the sole structure/foot-supporting member at the lateral edge of the footwear/foot-receiving device structure at a second location forward of the plane located at position 0.55L (and in some examples, forward of planes at 0.5L, 0.6L, or 0.65L).

Additionally or alternatively, in some example footwear and foot-receiving device structures in accordance with this invention, the medial strap tensioning component will define a medial turning location for the second strap portion (e.g., a ring, loop, or other structure around which the second strap portion winds or wraps so as to change its extension direction) and the lateral strap tensioning component will define a lateral turning location for the first strap portion (e.g., a ring, loop, or other structure around which the first strap portion winds or wraps so as to change its extension direction). Such footwear and foot-receiving device structures may include one or more of the following constructions and/or orientations when a bottom surface of the sole structure/foot-supporting member rests on a horizontal surface:

(a) the sole structure/foot-supporting member defines a longitudinal direction and a longitudinal length L from a rearmost heel location to a forwardmost toe location;

(b) at least some portion of the medial turning location (and optionally all of the medial turning location) is located rearward of a plane perpendicular to the longitudinal direction and located at a position 0.4L along the longitudinal direction, measured forward from the rearmost heel location (and in some examples, rearward of planes located at 0.45L, 0.35L, or 0.3L);

(c) at least some portion of the lateral turning location (and optionally all of the lateral turning location) is located rearward of the plane located at position 0.4L (and in some examples, rearward of planes located at 0.45L, 0.35L, or 0.3L);

(d) at least some portion of the medial turning location (and optionally all of the medial turning location) is located between two spaced, parallel planes perpendicular to the longitudinal direction and located at positions 0.2L and 0.45L, respectively, along the longitudinal direction, measured forward from the rearmost heel location (and in some examples, between two spaced, parallel planes located at positions 0.25L and 0.4L);

(e) at least some portion of the lateral turning location (and optionally all of the medial turning location) is located between the two spaced, parallel planes at positions 0.2L and 0.45L (and in some examples, between two spaced, parallel planes located at positions 0.25L and 0.4L); and/or

(f) the medial and/or lateral strap turning locations may be located somewhat forward and downward from locations of a wearer's medial and/or lateral malleolus protuberances when a wearer's foot is secured in an article of footwear according to aspects of this invention that is properly sized for the wearer's foot.

Additional aspects of this invention relate to methods of making articles of footwear and/or other foot-receiving devices that include: (a) producing the various footwear/foot-receiving device components (e.g., an upper or foot-covering component) with medial and/or lateral strap tensioning components (e.g., located/oriented as described above and in more detail below); (b) engaging a securing system including first and/or second strap portions of the types described above (e.g., and in the orientations described above and in more detail below) with the upper/foot-covering member and/or sole structure/foot-supporting member; (c) producing and/or engaging the various footwear/foot-receiving device components (e.g., an upper or foot-covering component) with medial and/or lateral strap securing components (e.g., located/oriented as described above and in more detail below); and/or (d) joining the upper/foot-covering member(s), securing system, and sole structure/foot-supporting member(s) together so as to form a footwear/foot-receiving device product (optionally fixedly engaging the strap portion(s) between the upper/foot-covering member and the sole structure/foot-supporting member).

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing Summary, as well as the following Detailed Description, will be better understood when read in conjunction with the accompanying drawings in which like reference numerals refer to the same or similar elements in all of the various views in which that reference number appears.

FIG. **1** is provided to help illustrate and explain background and definitional information useful for understanding certain terminology and aspects of this invention;

FIGS. **2**A through **2**E provide various views of an article of footwear in accordance with an example of this invention, including a securing system in accordance with an example of this invention;

FIGS. **2**F through **2**H provide various views showing use and operation of the example securing system shown in FIGS. **2**A through **2**E;

FIGS. **3**A through **3**C illustrate an article of footwear in accordance with another aspect of this invention, including a different securing system arrangement; and

FIGS. **4**A through **4**E illustrate features of a foam component that may be provided as part of an upper/foot-covering member in footwear/foot-receiving device structures in accordance with at least some examples of this invention (including the footwear structures shown in FIGS. **2**A through **3**C).

The reader should understand that the attached drawings are not necessarily drawn to scale.

DETAILED DESCRIPTION

In the following description of various examples of footwear and foot-receiving device structures and components according to the present invention, reference is made to the accompanying drawings, which form a part hereof, and in which are shown by way of illustration various example structures and environments in which aspects of the invention may be practiced. It is to be understood that other structures and environments may be utilized and that structural and functional modifications may be made from the specifically described structures without departing from the scope of the present invention.

I. DETAILED DESCRIPTION OF EXAMPLE ARTICLES OF FOOTWEAR OR OTHER FOOT-RECEIVING DEVICES ACCORDING TO THIS INVENTION

Referring to the figures and following discussion, various articles of footwear and features thereof in accordance with the present invention are disclosed. The footwear depicted and discussed are athletic shoes (e.g., basketball shoes), but the concepts disclosed with respect to this footwear may be applied to a wide range of athletic footwear styles, includ-

ing, but not limited to: walking shoes, tennis shoes, soccer shoes, football shoes, basketball shoes, running shoes, and cross-training shoes. In addition, the concepts of the present invention may be applied to a wide range of non-athletic footwear, including work boots, sandals, loafers, and dress shoes, as well as to other foot-receiving devices.

FIGS. **2**A-**2**E show various views of an article of footwear **200** in accordance with one example of this invention in the form of a high top basketball shoe. More specifically, FIG. **2**A shows a medial side view, FIG. **2**B shows a lateral side view, FIG. **2**C shows a top plan view, FIG. **2**D shows a front view, and FIG. **2**E shows a rear view of this shoe **200**. The article of footwear **200** includes an upper **202** and a sole structure **204** engaged with the upper **202**. While this engagement may be made in any desired manner, including in manners conventionally known and used in the footwear art, in this illustrated example, the upper **202** and the sole structure **204** are engaged by cements or adhesives. The upper **202** (optionally along with the sole structure **204**) defines an interior chamber **206** for receiving a wearer's foot, and access to this chamber **206** may be made through a foot-insertion opening **208** provided at the top, rearward area of the upper **202**.

The upper **202** may have any desired construction and/or may be made from any desired number of parts without departing from this invention. In some examples of this invention, the upper **202** will have a multiple layer construction, with various layers and/or combinations of layers at various locations so as to provide desired functions and/or characteristics, such breathability, abrasion/wear resistance, support for intended use, desired aesthetics, etc.

When present as a multi-layered upper construction, the upper **202** may be produced in any desired manner without departing from this invention, including in conventional manners as are known and used in the footwear art. As a more specific example, if desired, the upper **202** may include one or more "skin" layers **212** (e.g., a thin, thermoplastic elastomer sheet or membrane layer that provides abrasion resistance, support, desired aesthetics, etc.) made from a "no-sew" type material that may be adhered to an underlying mesh layer **214** (or other layer) using an adhesive or hot melt material, e.g., by application of heat and/or pressure. The mesh layer **214** provides a lightweight base and may be left exposed in certain areas to enhance breathability and flexibility at desired areas. As additional examples, if desired, the skin layer(s) **212** may be engaged with the underlying mesh layer **214** (or other layer) by cements or adhesives and/or by sewn seams. As yet additional examples, if desired, the upper **202** (or portions thereof) may be constructed by bonding various layers of materials using fusing techniques, e.g., as described in U.S. Pat. No. 8,429,835 and U.S. Pat. No. 8,321,984, each of which is entirely incorporated herein by reference.

The upper **202** may include other support elements at desired locations, optionally sandwiched between an exterior skin layer **212** and the underlying mesh layer **214** and/or other layers of the upper **202**. Additionally or alternatively, additional support may be provided as an exterior upper structure as well. For example, as shown in the figures, a heel counter **218** (e.g., to support a wearer's heel) is provided as an exterior component in this example footwear structure **200**. The heel counter **218**, when present, may be made from a rigid, thin plastic material, such as PEBAX, TPU, fiber reinforced plastics (e.g., carbon fiber or fiberglass), or other polymeric material, and it may include one or more openings (e.g., to control flexibility, breathability, support characteristics; to reduce weight; etc.). As other options, the heel counter **218** also may be made (at least in part) from a heavy textile material (e.g., leather), if desired.

If necessary or desired, still additional supports and/or components may be provided in other areas of the shoe **200**, such as in the forefoot or toe area (to provide protection and wear resistance, to provide shape support, etc.), at the lateral side or edge area near the fifth metatarsal head, etc. (e.g., to provide support for turning or cutting actions), at the medial side or edge area near the first metatarsal head, etc. FIGS. **2**A and **2**B show side edge support members **210**M and **210**L, respectively, along the medial side edge area (near the first metatarsal head) and the lateral side edge area (near the fifth metatarsal head) to provide additional support for these areas (e.g., when a sideways force is applied to the shoe **200**, such as when making a quick start, quick stop, turn, or cutting action). These support members **210**M and **210**L may include fingers of a stiffer, heavier, or harder upper material formed as one of the upper layers and applied to an exterior skin layer **212** via a hot melt adhesive or fusing technique. These fingers of support material **210**M, **210**L extend from the sole member **204**/upper **202** junction area and along the side edges of the upper **202** to partially enclose and support the side forefoot areas of the shoe **200**. The figures further show a toe cap **216** that further helps protect the toes (e.g., to provide a sturdier upper construction at the toe area, to provide shape support at the toe area, etc.).

Other potential materials that may be used in uppers **202** in accordance with at least some examples of this invention (including for components **210**L, **210**M, **216**, **218**, etc.) include one or more of: synthetic leather, natural leather, textiles, thermoplastic polyurethanes, any combination of these materials, and/or any combinations of these materials with any of the other materials described above. As another potential feature, if desired, at least some portion(s) of the upper **202** may be formed by a knitting procedure, such as flat knitting, circular knitting, etc. Optionally, at least a majority (or even all) of the upper **202** may be formed using knitting procedures, in at least some examples of this invention. Knitted textile components can be used to provide lightweight, breathable, and comfortable upper constructions.

The sole structure **204** also can take on any desired construction, components, and the like without departing from this invention. In the illustrated example, the sole structure **204** includes a single piece outsole **204***a* with a herringbone tread pattern that extends continuously to support an entire plantar surface of a wearer's foot. Portions of the outsole **204***a* wrap up around the side of the footwear structure **200** at some locations, e.g., to provide additional support, wear resistance, and/or other properties at those locations. More specifically, as shown in the figures, the outsole **204***a* of this example wraps upward and around the side of the shoe **200** in the forward toe area, at the lateral midfoot/forefoot area (behind upper lateral supports **210**L), around the entire the heel area (or, optionally, around one or more separated portions of the heel area), at the arch area, and at the medial midfoot/forefoot area (behind upper medial supports **210**M). The outsole **204***a* may wrap around the side edges of the footwear structure **200** at locations where the securing strap components are located and secured, as will be described in more detail below.

Also, while the outsole **204***a* is the only sole structure visible in this example shoe **200** construction, the shoe **200** may include other sole components, as well, such as midsole and/or insole components. A midsole provided in this shoe **200** may have the form of a polymeric foam material, e.g., located between the outsole structure **204***a* and a bottom

surface (e.g., a strobel member) of the upper **202**, located within the foot-receiving chamber **206** of the upper **202**, etc. Other sole structure options are possible without departing from this invention, such as one or more of: one or more impact-force attenuating columns (akin to SHOX type footwear products available from NIKE, Inc. of Beaverton, Oreg.); one or more fluid-filled bladders (akin to AIR type footwear products available from NIKE, Inc. of Beaverton, Oreg.); one or more lugs and/or sipes (e.g., to provide more natural motion, akin to sole structures used in FREE type footwear products available from NIKE, Inc. of Beaverton, Oreg.); mechanical shock absorbing structures; etc.

FIGS. **2**A-**2**D further illustrate that the article of footwear **200** of this example includes a closure member **220** over at least the instep area. The closure member **220** of this example constitutes a footwear "tongue" like element that includes a fabric component **220***a* (optionally a stretchable fabric) extending over and closing off the instep area and a soft free end **220***b* located near the foot-insertion opening **208**. The closure member **220** helps moderate the feel of the footwear securing system at the wearer's foot, which will be described in more detail below.

While a more conventional tongue structure and lacing system could be included in this article of footwear **200**, in this illustrated example, the fabric instep covering component **220***a* of the closure member **220** is fixed to other portions of the upper **202** along the instep area (e.g., by stitching or sewn seams), e.g., up to the location of the soft free end **220***b* and/or its attachment to the upper **202**. Instep covering component **220***a* may provide sufficient stretchability to accommodate insertion and removal of the foot from the foot-receiving chamber **206**. The rear edges **222** of the soft free end **220***b* of the closure member **220** are fixed to the upper **202** inside the foot-insertion opening **208** via a pair of elastic straps **224** (one strap **224** on the lateral side and one strap **224** on the medial side, each strap **224** being less than about 1 inch wide). The elastic straps **224** help keep the closure member **220** correctly positioned with respect to the foot and readily accessible to the wearer (e.g., so the free end **220***b* does not slip down into the foot-receiving chamber **206**), while providing adequate stretchability (via elastic straps **224**) to allow insertion and removal of the foot from chamber **206**.

Additional aspects of the illustrated example footwear securing system now will be described in more detail, additionally with reference to FIGS. **2**F through **2**H. As illustrated, in this example footwear **200** structure, the upper **202** includes a medial strap tensioning component **230**M located on the medial ankle side and a lateral strap tensioning component **230**L located on the lateral ankle side of the shoe **200**. The tensioning components **230**L and **230**M in this example are mounted on straps **232**L and **232**M, respectively, that extend from an exterior footwear support member **234**. While the illustrated straps **232**L and **232**M are provided as parts of a single support member **234** that extends around the rear heel of the shoe **200**, this is not a requirement. Rather, if desired, the tensioning components **230**L, **230**M may be mounted on straps **232**L, **232**M provided on separate support components **234** and/or may be otherwise mounted on portions of the footwear structure **200**.

While other structures are possible, in this illustrated example, the exterior footwear support member **234** constitutes a relatively heavy leather (natural or synthetic) or textile component (e.g., a thermoplastic polyurethane) or a plastic component that extends around the rear heel area outside of the heel counter element **218** and functions as a heel reinforcement element. Optionally, however, if desired, the support member **234** also may constitute a heel counter type element and/or it may be integrally formed with a heel counter element **218**. Also, while not a requirement, in this illustrated example, the support member **234** extends forward along the side edges of the footwear structure **200** and forms the lateral and medial supports **210**L and **210**M, respectively. The support member **234** may be engaged with other portions of the upper **202** construction (e.g., skin layer **212**, mesh layer **214**, heel counter **218**, etc.) in any desired manner, including in manners conventionally known and used in the art, such as one or more of: sewing or stitching; adhesive, cements, or hot melt; mechanical connectors; etc.

The tensioning components **230**L, **230**M may have any desired construction or structure without departing from the invention. In this illustrated example, the tensioning components **230**L, **230**M constitute structures that engage a strap for a securing system and structures against which a strap may apply a force to tighten the securing system (and thus tighten the fit of the shoe **200** on a wearer's foot). The illustrated tensioning components **230**L, **230**M are loops or ring shaped elements (e.g., D-rings, O-rings, C-rings, etc.) that, optionally together with the strap **232**L, **232**M, form an enclosure through which the strap is threaded, as will be described in more detail below. The tensioning components **230**L, **230**M provide a turning location for the strap, as will be described in more detail below.

The securing system of this illustrated example further includes two strap portions **240**A and **240**B that at least partially wrap around and engage upper **202** and the wearer's foot. The strap portions **240**A and **240**B may constitute separate straps or they may constitute opposite ends of a single strap or other component (e.g., a strap or other component that extends beneath the plantar support surface from the medial side edge to the lateral side edge of the shoe **200**). As shown, in this illustrated example shoe structure **200**, a first strap portion **240**A: (a) emerges from its engagement location between the sole member **204** and the upper **202** at the medial midfoot/forefoot area of the shoe **200**, (b) extends across the instep area, and (c) engages the lateral strap tensioning component **230**L, at which location the extension direction of the first strap portion **240**A abruptly turns. After wrapping around the lateral strap tensioning component **230**L, the first strap portion **240**A extends in front of the foot-insertion opening **208** and around to the medial ankle side of the upper **202**. A medial strap securing component **242**M may be provided on the medial ankle side of the upper (e.g., located on the medial side of the foot-insertion opening **208**) for securing a free end **246**A of the first strap portion **240**A. This securing connection between the free end **246**A of the first strap portion **240**A and the medial strap securing component **242**M may be a hook-and-loop fastener type connection, a buckle type connection, a snap type connection, a button type connection, etc. The medial strap securing component **242**M may be located in the vertical direction (with the shoe **200** standing on its sole **204** on a horizontal surface S) between the foot-insertion opening **208** and the medial strap tensioning component **232**M, in at least some example structures according to this invention.

In a similar manner, in this illustrated example shoe structure **200**, a second strap portion **240**B: (a) emerges from its engagement location between the sole member **204** and the upper **202** at the lateral midfoot/forefoot area of the shoe **200**, (b) extends across the instep area, and (c) engages the medial strap tensioning component **230**M, at which location the extension direction of the second strap portion **240**B

abruptly turns. After wrapping around the medial strap tensioning component **230**M, the second strap portion **240**B extends in front of the foot-insertion opening **208** and around to the lateral ankle side of the upper **202**. A lateral strap securing component **242**L may be provided on the lateral ankle side of the upper (e.g., located on the lateral side of the foot-insertion opening **208**) for securing a free end **246**B of the second strap portion **240**B. This securing connection between the free end **246**B of the second strap portion **240**B and the lateral strap securing component **242**L may be a hook-and-loop fastener type connection, a buckle type connection, a snap type connection, a button type connection, etc. The lateral strap securing component **242**L may be located in the vertical direction between the foot-insertion opening **208** and the lateral strap tensioning component **232**L, in at least some example structures according to this invention. As shown in the figures, in this illustrated structure, when fully engaged, the first strap portion **240**A and the second strap portion **240**B cross one another two times at two separated crossing locations (e.g., once in the instep area **270** of the upper **202** and once again rearward (and upward) from the first, instep area location and near the foot-insertion opening). The two strap portions **240**A, **240**B may cross over one another in any desired stacking layer order without departing from the invention (e.g., either strap **240**A, **240**B may be on top at either crossing location).

Footwear **200** and their securing system structures in accordance with at least some examples of this invention may have at least some of the properties described below. For example, as illustrated in FIGS. **2**A and **2**C, the first strap portion **240**A may be fixedly engaged between the upper **202** and the sole structure **204** and emerge from between these components at a first strap engagement location located along the medial side edge of the shoe **200**. While it could be provided at any desired location on the article of footwear structure **200**, this first strap portion **240**A emerging/engagement location may be located forward of the first strap crossing location. Similarly, as illustrated in FIGS. **2**B and **2**C, the second strap portion **240**B may be fixedly engaged between the upper **202** and the sole structure **204** and emerge from between these components at a second strap engagement location located along the lateral side edge of the shoe **200**. While it also could be provided at any desired location on the article of footwear structure **200**, this second strap portion **240**B emerging/engagement location also may be located forward of the first strap crossing location. While the first and second strap emerging/engagement locations may be at the same longitudinal positions, the medial longitudinal emerging/engagement location for the first strap portion **240**A may be somewhat rearward of the lateral longitudinal emerging/engagement location for the second strap portion **240**B.

Other features and characteristics of at least some example footwear/foot-receiving device structures **200** according to this invention may be described with reference to a predetermined orientation of the article of footwear/foot-receiving device **200** or component thereof as described above with respect to FIG. **1**, e.g., in an orientation in which a bottom surface **204***b* of the sole structure **204** rests on a horizontal surface S. In this orientation, the sole structure **204** defines a longitudinal direction and a longitudinal length L from a rearmost heel RH location to a forwardmost toe FT location. In this orientation, as shown in FIG. **2**A, a forward edge **250**A of the first strap portion **240**A may meet (or emerge from) the sole structure **204** at the medial side of the upper **202** at a location **252**A forward of a plane perpendicular to the longitudinal direction and located at a position 0.6L along the longitudinal direction (measured forward from the rearmost heel RH location). Additionally or alternatively, if desired, in this orientation, as shown in FIG. **2**B, a forward edge **250**B of the second strap portion **240**B may meet (or emerge from) the sole structure **204** at the lateral side of the upper **202** at a location **252**B forward of a plane perpendicular to the longitudinal direction and located at a position 0.6L along the longitudinal direction (measured forward from the rearmost heel RH location). In some example structures in accordance with this invention, the forward edge(s) **250**A and/or **250**B of strap portions **240**A, **240**B, respectively, may meet (or emerge from) the sole structure **204** at their respective medial or lateral sides of the upper **202** forward of planes perpendicular to the longitudinal direction and located at: (a) positions 0.55L forward from the rearmost heel RH location, (b) positions 0.65L forward from the rearmost heel RH location, (c) positions 0.7L forward of the rearmost heel RH location, (d) positions 0.75L forward of the rearmost heel RH location, and/or (e) positions 0.8L forward of the rearmost heel RH location. In some examples, the forward edge(s) **250**A and/or **250**B may meet (or emerge from) the sole structure **204** at their respective medial or lateral sides of the upper **202** between two spaced, parallel planes perpendicular to the longitudinal direction and located at: (a) positions 0.55L and 0.85L forward from the rearmost heel RH location and/or (b) positions 0.6L and 0.8L forward from the rearmost heel RH location.

As another example feature in accordance with some aspects of this invention, with the article of footwear **200** oriented on a horizontal surface S in the manner described above: (a) a rear edge **260**A of the first strap portion **240**A may meet (or emerge from) the sole structure **204** at the medial side of the upper **202** at a location **262**A forward of a plane perpendicular to the longitudinal direction and located at a position 0.55L along the longitudinal direction (measured forward from the rearmost heel RH location), and/or (b) a rear edge **260**B of the second strap portion **240**B may meet (or emerge from) the sole structure **204** at the lateral side of the upper **202** at a second location forward of the plane located at position 0.55L. In some example structures in accordance with this invention, the rear edge(s) **260**A and/or **260**B of strap portions **240**A, **240**B, respectively, may meet (or emerge from) the sole structure **204** at their respective medial or lateral sides of the upper **202** forward of planes perpendicular to the longitudinal direction and located at: (a) positions 0.5L forward from the rearmost heel RH location, (b) positions 0.6L forward from the rearmost heel RH location, (c) positions 0.65L forward of the rearmost heel RH location, (d) positions 0.7L forward of the rearmost heel RH location, and/or (e) positions 0.75L forward of the rearmost heel RH location. In some examples, the rear edge(s) **260**A and/or **260**B may meet (or emerge from) the sole structure **204** at their respective medial or lateral sides of the upper **202** between two spaced, parallel planes perpendicular to the longitudinal direction and located at: (a) positions 0.5L and 0.75L forward from the rearmost heel RH location and/or (b) positions 0.55L and 0.7L forward from the rearmost heel RH location.

As another example feature, if desired, the entire width of the strap portions **240**A and **240**B (i.e., both the forward edges **250**A, **250**B and the rear edges **260**A, **260**B) may be located at any of the longitudinal positions and/or within any of the longitudinal positional ranges (e.g., with respect to the planes perpendicular to the longitudinal direction) described above for forward edges **250**A, **250**B and/or for the rear edges **260**A, **260**B. Additionally or alternatively, rather than

emerging from and/or being fixed between the upper **202** and the sole structure **204** at the noted longitudinal positions, the strap portions **240**A and/or **240**B may be fixedly engaged with the upper **202** and/or sole structure **204** at any of the above-noted longitudinal positions and/or within any of the above-noted longitudinal positional ranges, e.g., along the side or edge of the upper **202** and/or sole structure **204**. This fixed engagement may be accomplished, for example, by sewing or stitching; by mechanical connectors; by adhesives, cements, or fusing techniques; and/or by other desired means.

The width W of the strap portion **240**A at the location where it emerges from the medial side of the sole (e.g., the direct dimension between forward edge **250**A and rear edge **260**A just above the sole member **204***a* on the medial side) may be about 40 mm in this illustrated example structure (or in some example structures, about 55 mm). Likewise, the width W of the strap portion **240**B at the location where it emerges from the lateral side of the sole (e.g., the direct dimension between forward edge **250**B and rear edge **260**B just above the sole member **204***a* on the lateral side) may be about 40 mm in the illustrated example structure (or in some example structures, about 55 mm). At the lateral and medial side strap turning locations (described in more detail below, e.g., at tensioning components **230**L, **230**M), the width W of straps **240**A and/or **240**B may be about 25 mm in this illustrated example structure (or in some example structures, about 30 or 35 mm). At their free ends **246**A and **246**B, straps **240**A and/or **240**B may be about 20 mm wide (or in some examples about 25 mm). The strap width dimensions may taper over at least some portion of its length, change at a constant or varying rate over at least some portion of its length, change in a stepwise manner, etc., without departing from this invention.

Additional features and aspects of at least some examples of this invention may relate to the longitudinal positioning of the tensioning components **230**L, **230**M (and thus the locations at which the strap portions **240**A, **240**B abruptly turn associated with these example tensioning components **230**L, **230**M (also called "turning locations" herein)). The "turning locations" in this illustrated example are the locations on the tensioning components **230**L, **230**M around which the strap portions **240**A, **240**B partially wrap to change direction (and about which force is applied to the tensioning components **230**L, **230**M when the strap portions **240**A, **240**B are pulled to tighten them). As described above in conjunction with FIG. **1**, the following features are determined when a bottom surface **204***b* of the sole structure **204** rests on a horizontal surface S and the sole structure **204** defines a longitudinal direction and a longitudinal length L from a rearmost heel RH location to a forwardmost toe FT location. In this orientation, as also shown in FIG. **2**A, at least some portion (and optionally all) of the medial turning location (about tensioning component **230**M) is located rearward of a plane perpendicular to the longitudinal direction and located at a position 0.4L along the longitudinal direction, measured forward from the rearmost heel location RH. Additionally or alternatively, at least some portion of the lateral turning location (about tensioning component **230**L) is located rearward of the plane located at position 0.4L. In some examples of this invention, all or at least some portion(s) of the medial and/or lateral turning locations may be located at positions rearward of planes perpendicular to the longitudinal direction and located at longitudinal positions 0.45L, 0.35L, or even 0.3L. In some structures in accordance with this invention, some or all of the lateral and/or medial turning locations will be located between two spaced, parallel planes perpendicular to the longitudinal direction and located at longitudinal positions 0.2L and 0.45L, and in some examples, between two spaced, parallel planes perpendicular to the longitudinal direction and located at longitudinal positions 0.25L and 0.4L. The strap "turning locations" may be considered as bounded by the portions of the longitudinal width of the strap portions **240**A, **240**B wrapped around the tensioning members **230**L, **230**M, as shown in FIGS. **2**A and **2**B. Tension applied to the tensioning components **230**L, **230**M by the tightened strap portions **240**A, **240**B applies a pulling force to straps **232**L, **232**M and the support member **234** (which wraps around the heel area in this example) to thereby apply a tightening force to the shoe **200**.

While they may be provided at other locations, the "turning locations" and the tensioning members **230**L and **230**M that provide them in this illustrated example are located somewhat forward and downward from a location of a wearer's medial and/or lateral malleolus protuberances (i.e., the boney protrusions at the ankles) when a wearer's foot is secured in an article of footwear **200** that is properly sized for the wearer's foot. This arrangement and orientation of the tensioning members **230**L and **230**M can provide a more comfortable fit and feel (e.g., the straps and/or tensioning members **230**L, **230**M will not put pressure on the malleolus protuberances) when the straps are tightened, as will be described in more detail below.

Securing the footwear securing system now will be described in more detail with reference again to FIGS. **2**F to **2**H. FIG. **2**F shows the securing system fully unsecured or disengaged, with the strap portions **240**A and **240**B fixedly engaged at midfoot/forefoot side locations by being glued between the sole structure **204** and the upper **202** and/or otherwise fixed to the sole structure **204** and/or upper **202** (e.g., by stitching or sewing, by mechanical connectors, etc.). As noted above, the strap portions **240**A and **240**B may constitute two independent strap elements, opposite sides of a single strap element (e.g., that extends between the sole structure **204** and the upper **202** under the plantar support surface of the shoe **200**), and/or portions of another footwear component. When fixed, this engagement will be sufficiently strong so as to allow a user to apply necessary force to the strap portions **240**A, **240**B to tighten the securing system with the upper **202** and foot without pulling the strap portions **240**A, **240**B away from their connection/emerging locations.

From the disengagement arrangement shown in FIG. **2**F, the second strap portion **240**B is extended across the instep area **270** of the shoe **200** and the free end **246**B thereof is engaged with the medial strap tensioning component **230**M (e.g., the free end **246**B of the strap portion **240**B is threaded through the ring member of tensioning component **230**M so that the strap portion **240**B abruptly turns back around the ring member). Similarly, the first strap portion **240**A is extended across the instep area **270** of the shoe **200** and the free end **246**A thereof is engaged with the lateral strap tensioning component **230**L (e.g., the free end **246**A of the strap portion **240**A is threaded through the ring member of tensioning component **230**L so that the strap portion **240**A abruptly turns back around the ring member). At this stage, this example securing system may have the appearance shown in FIG. **2**G, with the two strap portions **240**A, **240**B crossing one another at the instep area **270**. The strap portions **240**A, **240**B may be extended across the instep area **270** in any desired order (e.g., with either **240**A or **240**B on top).

The tensioning components **230**L and **230**M allow the free ends **246**A, **246**B of the strap portions **240**A, **240**B to

be pulled to securely engage the shoe **200** with a wearer's foot. As one step, the free end **246**B of strap portion **240**B is pulled tight around tensioning component **230**M and stretched around and in front of the foot-insertion opening **208** (in front of the tongue portion **220***b*). From there, the strap portion **240**B further extends along the lateral side of the foot-insertion opening **208** to a securing component **242**L provided on the upper **202** (and/or optionally on the sole structure **204**). Some area of the strap portion **240**B (e.g., its free end **246**B) may include a corresponding securing component **248**B for engaging the securing component **242**L. Similarly (and optionally at the same time), the free end **246**A of strap portion **240**A is pulled tight around tensioning component **230**L and stretched around and in front of the foot-insertion opening **208** (in front of the tongue portion **220***b*). From there, the strap portion **240**A further extends along the medial side of the foot-insertion opening **208** to a securing component **242**M provided on the upper **202** (and/or optionally on the sole structure **204**). Some area of the strap portion **240**A (e.g., its free end **246**A) may include a corresponding securing component **248**A for engaging the securing component **242**M. As shown in FIG. **2**H, in this arrangement, the two strap portions **240**A, **240**B cross one another a second time at a second, separate crossing location (e.g., at the instep area **270**, rearward and/or higher than the first crossing location, adjacent the top portion **220***b* of the tongue member, etc.). The strap portions **240**A, **240**B may be stretched across the front of the foot-insertion opening **208** in any desired order (e.g., with either **240**A or **240**B on top), and this stacking order may be the same as or different from the stacking order at the other crossing location.

The two illustrated crossing locations may constitute the only strap crossing locations for strap portions **240**A, **240**B in some example footwear structures **200** according to the invention (and these two crossing locations may constitute the only strap crossing locations in the entire shoe structure **200**). Also, if desired, the strap portions **240**A, **240**B may change in width over the course of their length (e.g., in a tapered or stepped manner). Optionally, a wider strap portion width may be provided nearer to the engagement/emerging location(s) at the midfoot/forefoot area of the shoe **200** as compared to a narrower strap portion width that may be provided in the area(s) through tensioning members **230**L, **230**M and/or near/at the free ends **246**A, **246**B. The two strap portions **240**A, **240**B may constitute the only straps and/or the only footwear securing components forward of the 0.4L plane for securing the shoe **200** to a foot, optionally without the presence of a conventional footwear lace type securing system. In some examples of this invention, the width of a strap portion may vary such that the widths at the emerging locations ("W_E"), the widths at the turning locations ("W_T"), and the widths at the free ends ("W_F") follow one or more of the following relationships:

$$W_T = 0.3W_E \text{ to } 0.7W_E$$

$$W_F = 0.2W_E \text{ to } 0.6W_E$$

$$W_F = 0.5W_T \text{ to } 1.0W_T$$

$$W_F = 0.5W_T \text{ to } 0.8W_T$$

The securing components **242**L, **242**M, **248**A, and **248**B may be any desired type of securing component structure, such as a hook-and-loop type fastener system, a buckle type fastener, a button type fastener, a snap type fastener, etc. Alternatively or additionally, if desired, the free ends **246**A and **246**B of the strap portions **240**A and **240**B may be engaged together, e.g., by tying, snaps, buttons, buckles, etc. The free ends **246**A, **246**B also could be engaged with a mechanical component, such as a take up reel or other device around which excess strap (e.g., **240**A, **240**B) may be wound for storage.

In at least some examples of this invention, including the example shown in FIGS. **2**A through **2**H, the shoe does not include conventional footwear shoelaces and/or eyelets. Rather, the straps **240**A, **240**B, the tensioning members **230**L, **230**M, and the strap securing systems (e.g., the hook-and-loop fastener, etc.) may be the main or only manner of securing the article of footwear **200** to the wearer's foot (and/or tightening the shoe to the wearer's foot). Thus, the main components for tightening the shoe to the wearer's foot in at least some example structures in accordance with this invention may consist essentially of: (a) two straps (e.g., **240**A, **240**B), (b) two tensioning components (e.g., **230**L, **230**M), and (c) a securing system for securing the straps **240**A, **240**B with the upper **202** and/or other footwear component (e.g., hook-and-loop fasteners, etc.). Eliminating the conventional lace system along with instep area (e.g., as with conventional shoes) may allow the front forefoot area of shoe **200** to be free of laces and/or straps, which can allow the wearer's forefoot and/or toes to move somewhat more freely (e.g., splay out when landing a step or jump, etc.) and thereby improve the overall comfort of the shoe **200** for the wearer.

Alternatively, if desired, shoe structures in accordance with some examples of this invention may include a conventional lacing system (e.g., including a more conventional tongue (e.g., one not sewn shut and fixed to the upper along the instep area), a conventional shoe lace, and conventional eyelets or other lace engaging structures), e.g., located beneath the strap portions **240**A, **240**B. The inclusion of the additional and more conventional lace features may be useful to provide shoe models that allow the instep area to be opened wider for insertion of the foot (e.g., as compared to the more sewn up, fixed, and closed off tongue and instep area shown in the embodiment of FIGS. **2**A-**2**H).

FIGS. **3**A-**3**C illustrate another example article of footwear **300** in accordance with at least some aspects of this invention. FIGS. **3**A and **3**B show the lateral side of shoe **300** with the strap secured (FIG. **3**A) and unsecured (FIG. **3**B), and FIG. **3**C shows the medial side of the shoe **300**. The upper and sole construction of the example shoe **300** of FIGS. **3**A-**3**C may be the same as or similar to those described above with respect to FIGS. **2**A-**2**H. The main differences between shoes **200** and **300** lie in the strap components **340**A and **340**B and the manner in which the strap components **340**A and **340**B are secured to tighten the shoe **300** to a wearer's foot.

First, the strap components **340**A and **340**B of this illustrated example are somewhat wider than the strap components **240**A and **240**B shown in the illustrated example of FIGS. **2**A-**2**H (e.g., on the larger side of the dimensions and dimension ranges described above, e.g., at the medial and lateral "emerging locations" **360**A (e.g., about 55 mm), at the "turning locations" **360**B (e.g., about 30 mm), and at the "free ends" **360**C (e.g., about 25 mm)). Wide strap components, like those described in conjunction with FIGS. **2**A through **3**C, may help provide a more comfortable feel as they help disperse pressure applied to the foot by the straps **240**A, **240**B, **340**A, **340**B over a wider contact area when the securing system is tightened down on the wearer's foot.

The free ends **360**C of the strap components **340**A and **340**B in this illustrated example structure **300** also differ

from the examples shown above in conjunction with FIGS. **2**A-**2**H. In the example of FIGS. **2**A-**2**H, the free ends **246**A, **246**B of strap portions **240**A, **240**B included a portion of a securing component (e.g., a portion of a hook-and-loop fastener **248**A, **248**B) that engaged with another portion of the securing component (e.g., another part of the hook-and-loop fastener **242**L, **242**M) provided on or as part of the footwear upper **202** at/near the foot-receiving opening area. In the example of FIGS. **3**A-**3**C, however, the free ends **360**C of each of the strap components **340**A, **340**B are equipped (e.g., engaged by sewing, mechanical connectors, etc.) with a strap tensioning component **320**. The strap tensioning components **320** may be tensioning components of the types described above with respect to strap tensioning components **230**L and **230**M (such as a D-ring, an O-ring, a C-ring, etc.).

As shown in FIGS. **3**A and **3**B, the strap tensioning components **320** at the free end **360**C of strap portion **340**B engages with a strap element **370** provided at the lateral side of the foot-receiving opening of the shoe **300**. The strap element **370** may be engaged with the footwear upper, e.g., by sewing or stitching, by adhesives or cements, by mechanical connectors, etc. In use, the free end **370**A of strap element **370** is fed through the tensioning component **320**, the strap element **370** is pulled tight around tensioning component **320** and folded back over itself (to thereby tighten strap portion **340**B around the wearer's foot, which pulls on a tensioning component (like **330**L) on the medial side of the shoe **300**), and the free end **370**A of the strap element **370** is secured to the upper at the foot-receiving opening area (e.g., via a hook-and-loop fastener, a portion of which is engaged with the strap free end **370**A (the underside to that shown in FIG. **3**A) and a portion of which is shown as element **372**). Similar strap free ends **360**C and tensioning components **320** can be provided on strap portion **340**A (on the medial side of the shoe **300**, as shown in FIG. **3**C), and similar strap elements **370**, strap free ends **370**A, and fastener component(s) **372** can be provided on the other (medial) side of the shoe **300** for pulling strap **340**A tight around the tensioning component **330**L.

If desired, the strap elements **370** on the lateral and medial sides of the foot-receiving opening may be separate components that are separately engaged with the footwear upper such that one end of the strap element **370** is secured to the upper (and includes the fastener component **372** thereon) and the other end of the strap element **370** is the free end **370**A that threads through the tensioning component **320**. Alternatively, if desired, a single strap element **370** may wrap around the rear portion of the foot-receiving opening such that the free ends **370**A on the lateral and medial sides are opposite ends of a single strap (e.g., and the center of this single strap may be fixed to the upper at the foot-receiving opening area and/or pass through the rear loop **374** around the rear of the upper to join the lateral and medial sides of the strap element **370**).

As shown in FIG. **3**C, the medial side view of this example shoe structure **300** appears similar to the structures shown in FIG. **2**A (with similar components and component placements, etc.), except: (a) the component parts (e.g., turning or tensioning components, etc.) may be changed somewhat to accommodate the wider strap dimensions **340**A and **340**B and (b) the medial securing system (e.g., the free end of the strap **340**A at the foot-receiving opening) has hardware (e.g., tensioning component **320**) and is secured (e.g., to a strap **370**) in a manner similar to the hardware and securing system shown in FIG. **3**A for the lateral side of the shoe.

As evident from FIGS. **3**A-**3**C, this article of footwear **300** is tightened around a wearer's foot by feeding the free ends **370**A of straps **370** through the tensioning components **320** provided at the free ends **360**C of strap portions **340**A and **340**B. The free ends **370**A of straps **370** are then pulled rearward around tensioning components **320** to tighten the straps **340**A and **340**B and are secured in place via hook-and-loop fasteners **372** (or other appropriate or desired securing means). This action pulls straps **340**A, **340**B tight around tensioning components **330**L, **330**M. Alternatively, if desired, the free ends **370**A of straps **340**A and **340**B could be secured in another manner, such as via a buckle, button, snap, etc., and/or excess strap at the free ends **370**A could be secured in a take-up spool or other desired component, excess strap at the free ends **370**A could be tied together, etc. As another option or alternative, if desired, one or both of the tensioning components **320** may be provided at a free end of strap **370** and then the free ends **360**C of straps **340**A and/or **340**B could be fed through those tensioning components **320** and secured (e.g., folded back on themselves toward and/or over the instep area and secured via a hook-and-loop fastener or other fastener). Other ways of securing the strap portions **340**A and **340**B to secure the shoe **300** to the foot also may be used without departing from this invention.

Like the example shown in FIGS. **2**A through **2**H, the shoe **300** of FIGS. **3**A-**3**C does not include conventional footwear shoelaces and/or eyelets. Rather, the straps **340**A, **340**B, the tensioning members **330**L, **330**M, and the strap securing systems (e.g., the rings **320**, strap(s) **370**, and the securing systems (e.g., hook-and-loop fastener **372**, etc.)) may be the main or only manner of securing the article of footwear **300** to the wearer's foot (and/or tightening the shoe to the wearer's foot). Thus, the main components for tightening the shoe **300** to the wearer's foot in at least some example structures in accordance with this example of the invention may consist essentially of: (a) two straps (e.g., **340**A, **340**B), (b) two tensioning components (e.g., **330**L, **330**M), and (c) a securing system (e.g., for securing the straps **340**A, **340**B with the upper (e.g., the rings **320**, strap(s) **370**, and the securing systems (e.g., hook-and-loop fastener **372**, etc.)). Again, eliminating the conventional lace system along with instep area (e.g., as with conventional shoes) may allow the front forefoot area of shoe **300** to be free of laces and/or straps, which can allow the wearer's forefoot and/or toes to move somewhat more freely (e.g., splay out when landing a step or jump, etc.) and thereby improve the overall comfort of the shoe **300** for the wearer.

Alternatively, if desired, shoe structures in accordance with some examples of this invention may include a conventional lacing system (e.g., including a more conventional tongue (not sewn shut and fixed at the instep area), a conventional shoe lace, and conventional eyelets or other lace engaging structures), e.g., located beneath the strap portions **340**A, **340**B. The inclusion of the additional and more conventional lace features may be useful to provide shoe models that allow the instep area to be opened wider for insertion of the foot (e.g., as compared to the more sewn up, fixed, and closed off tongue and/or instep area shown in the embodiment of FIGS. **3**A-**3**C).

FIGS. **4**A-**4**E illustrate another example feature that may be included in articles of footwear in accordance with at least some examples of this invention, including the articles of footwear **200**, **300** shown in FIGS. **2**A-**3**C above. More specifically, FIGS. **4**A through **4**E show a foam comfort-enhancing element **400** that may be provided around the side and rear heel/Achilles area of the foot. The comfort-enhanc-

ing element **400** constitutes a relatively thick foam "pillow" component **402** (FIG. **4**A) that is embedded between layers of the footwear upper. More specifically, the foam pillow component **402** is embedded between (a) the outermost footwear upper materials (e.g., materials **212** and **218** from FIGS. **2**A and **2**B, which may be relatively stiff, to provide support for the foot/ankle, durability, and abrasion resistance) and (b) a soft and smooth interior fabric lining **404** (FIG. **4**B, which may be somewhat larger than the foam pillow component **402**) at the interior foot-receiving chamber of the shoe for contacting the wearer's foot. Note also FIGS. **4**C-**4**E.

In the final upper product, the ends **402**A of the foam pillow component **402** may be located somewhat upward and rearward of the strap turning locations, e.g., the turning locations defined by the tensioning components **230**L, **230**M, **330**L, **330**M. Additionally, the central area **402**B of the foam pillow component **402** extends around the rear heel/Achilles area of the foot when the shoe is worn. The foam pillow component **402** helps fill in areas around the rear and ankle portion of the foot to provide a more stable and secure feel when the upper is secured to the foot and provide a soft, comfortable feel.

II. CONCLUSION

The present invention is disclosed above and in the accompanying drawings with reference to a variety of embodiments and/or options. The purpose served by the disclosure, however, is to provide examples of various features and concepts related to the invention, not to limit the scope of the invention. One skilled in the relevant art will recognize that numerous variations and modifications may be made to the features of the invention described above without departing from the scope of the present invention, as defined by the appended claims.

What is claimed is:

1. An article of footwear, comprising:

an upper defining a foot-insertion opening, a lateral ankle side, a medial ankle side, and an instep area forward of the foot-insertion opening, wherein the upper includes:

a medial strap tensioning component located on the medial ankle side, and

a lateral strap tensioning component located on the lateral ankle side;

a sole structure engaged with the upper; and

a securing system engaged with the upper, wherein the securing system includes:

a first strap portion having a first terminal end permanently secured on a medial side of the upper, extending across the instep area, engaging the lateral strap tensioning component, extending in front of the foot-insertion opening, and having a second terminal end removably secured to the medial ankle side, and

a second strap portion having a first terminal end permanently secured on a lateral side of the upper, extending across the instep area, engaging the medial strap tensioning component, extending in front of the foot-insertion opening, and having a second terminal end removably secured to the lateral ankle side,

wherein the first and second strap portions cross one another at two separated crossing locations.

2. An article of footwear according to claim **1**, further comprising:

a medial strap securing component located on the medial side of the foot-insertion opening for securing the second end of the first strap portion, wherein the medial strap securing component is located between the foot-insertion opening and the medial strap tensioning component; and

a lateral strap securing component located on the lateral side of the foot-insertion opening for securing the second end of the second strap portion, wherein the lateral strap securing component is located between the foot-insertion opening and the lateral strap tensioning component.

3. An article of footwear according to claim **1**, wherein the medial strap tensioning component and the lateral strap tensioning component are engaged with a heel reinforcement component that extends around a rear heel area of the upper from the medial strap tensioning component to the lateral strap tensioning component.

4. An article of footwear according to claim **3**, wherein the heel reinforcement component includes a heel counter structure.

5. An article of footwear according to claim **1**, wherein the article of footwear is a high-top basketball shoe.

6. An article of footwear, comprising:

an upper defining a foot-insertion opening, a lateral side, a medial side, and an instep area, wherein the upper includes:

a medial strap tensioning component located on the medial side of the foot-insertion opening,

a lateral strap tensioning component located on the lateral side of the foot-insertion opening,

a medial strap securing component located on the medial side of the foot-insertion opening and between the medial strap tensioning component and the foot-insertion opening, and

a lateral strap securing component located on the lateral side of the foot-insertion opening and between the lateral strap tensioning component and the foot-insertion opening;

a sole structure engaged with the upper, wherein the upper and the sole structure meet at a medial edge and a lateral edge of the article of footwear; and

a securing system engaged with the upper, wherein the securing system includes:

a first strap portion having a first terminal end permanently positioned at the medial edge, extending across the instep area, engaging the lateral strap tensioning component, extending in front of the foot-insertion opening, and having a second terminal end removably secured to the upper with the medial strap securing component, and

a second strap portion having a first terminal end permanently positioned at the lateral edge, extending across the instep area, engaging the medial strap tensioning component, extending in front of the foot-insertion opening, and having a second terminal end removably secured to the upper with the lateral strap securing component,

wherein the first and second strap portions cross one another at a first crossing location at the instep area of the upper and at a second crossing location located rearward from the first crossing location.

7. An article of footwear according to claim **6**, wherein the first strap portion and the second strap portion are provided as separate strap components.

8. An article of footwear according to claim **6**, wherein the first strap portion is fixedly engaged between the upper and the sole structure at a first strap engagement location located forward of the first crossing location, and wherein the second strap portion is fixedly engaged between the upper

and the sole structure at a second strap engagement location located forward of the first crossing location.

9. An article of footwear according to claim **8**, wherein when a bottom surface of the sole structure rests on a horizontal surface:

(a) the sole structure defines a longitudinal direction and a longitudinal length L from a rearmost heel location to a forwardmost toe location,

(b) a forward edge of the first strap portion meets the sole structure at the medial edge at a first location forward of a plane perpendicular to the longitudinal direction and located at a position 0.6L along the longitudinal direction, measured forward from the rearmost heel location, and

(c) a forward edge of the second strap portion meets the sole structure at the lateral edge at a second location forward of the plane located at position 0.6L.

10. An article of footwear according to claim **8**, wherein when a bottom surface of the sole structure rests on a horizontal surface:

(a) the sole structure defines a longitudinal direction and a longitudinal length L from a rearmost heel location to a forwardmost toe location,

(b) a rear edge of the first strap portion meets the sole structure at the medial edge at a first location forward of a plane perpendicular to the longitudinal direction and located at a position 0.55L along the longitudinal direction, measured forward from the rearmost heel location, and

(c) a rear edge of the second strap portion meets the sole structure at the lateral edge at a second location forward of the plane located at position 0.55L.

11. An article of footwear according to claim **6**, wherein the medial strap securing component is a portion of a first hook-and-loop fastener located adjacent the medial side of the foot-insertion opening, and wherein the lateral strap securing component is a portion of a second hook-and-loop fastener located adjacent the lateral side of the foot-insertion opening.

12. An article of footwear according to claim **6**, wherein the medial strap tensioning component includes a first component around which the second strap portion wraps to change an extension direction of the second strap portion, and wherein the lateral strap tensioning component includes a second component around which the first strap portion wraps to change an extension direction of the first strap portion.

13. An article of footwear according to claim **6**, wherein the medial strap tensioning component includes a first loop through which the second strap portion extends, and wherein the lateral strap tensioning component includes a second loop through which the first strap portion extends.

14. An article of footwear according to claim **6**, wherein the medial strap tensioning component defines a medial turning location for the second strap portion and the lateral strap tensioning component defines a lateral turning location for the first strap portion.

15. An article of footwear according to claim **14**, wherein when a bottom surface of the sole structure rests on a horizontal surface:

the sole structure defines a longitudinal direction and a longitudinal length L from a rearmost heel location to a forwardmost toe location,

(a) at least some portion of the medial turning location is located rearward of a plane perpendicular to the longitudinal direction and located at a position 0.4L along the longitudinal direction, measured forward from the rearmost heel location, and

(b) at least some portion of the lateral turning location is located rearward of the plane located at position 0.4L.

16. An article of footwear according to claim **15**, wherein when the bottom surface of the sole structure rests on a horizontal surface:

(a) a forward edge of the first strap portion meets the sole structure at the medial edge at a first location forward of a plane perpendicular to the longitudinal direction and located at a position 0.6L along the longitudinal direction, measured forward from the rearmost heel location, and

(b) a forward edge of the second strap portion meets the sole structure at the lateral edge at a second location forward of the plane located at position 0.6L.

17. An article of footwear according to claim **15**, wherein when the bottom surface of the sole structure rests on a horizontal surface:

a rear edge of the first strap portion meets the sole structure at the medial edge at a first location forward of a plane perpendicular to the longitudinal direction and located at a position 0.55L along the longitudinal direction, measured forward from the rearmost heel location, and

(a) a rear edge of the second strap portion meets the sole structure at the lateral edge at a second location forward of the plane located at position 0.55L.

18. An article of footwear according to claim **14**, wherein when a bottom surface of the sole structure rests on a horizontal surface:

the sole structure defines a longitudinal direction and a longitudinal length L from a rearmost heel location to a forwardmost toe location,

(a) all of the medial turning location is located rearward of a plane perpendicular to the longitudinal direction and located at a position 0.4L along the longitudinal direction, measured forward from the rearmost heel location, and

(b) all of the lateral turning location is located rearward of the plane located at position 0.4L.

19. An article of footwear according to claim **18**, wherein when the bottom surface of the sole structure rests on a horizontal surface:

a forward edge of the first strap portion meets the sole structure at the medial edge at a first location forward of a plane perpendicular to the longitudinal direction and located at a position 0.6L along the longitudinal direction, measured forward from the rearmost heel location, and

(a) a forward edge of the second strap portion meets the sole structure at the lateral edge at a second location forward of the plane located at position 0.6L.

20. An article of footwear according to claim **18**, wherein when the bottom surface of the sole structure rests on a horizontal surface:

a rear edge of the first strap portion meets the sole structure at the medial edge at a first location forward of a plane perpendicular to the longitudinal direction and located at a position 0.55L along the longitudinal direction, measured forward from the rearmost heel location, and

(a) a rear edge of the second strap portion meets the sole structure at the lateral edge at a second location forward of the plane located at position 0.55L.

21. An article of footwear according to claim **14**, wherein when a bottom surface of the sole structure rests on a horizontal surface:

(a) the sole structure defines a longitudinal direction and a longitudinal length L from a rearmost heel location to a forwardmost toe location,

(b) at least some portion of the medial turning location is located between two spaced, parallel planes perpendicular to the longitudinal direction and located at positions 0.2L and 0.45L, respectively, along the longitudinal direction, measured forward from the rearmost heel location, and

(c) at least some portion of the lateral turning location is located between the two spaced, parallel planes.

22. An article of footwear according to claim **14**, wherein when a bottom surface of the sole structure rests on a horizontal surface:

(a) the sole structure defines a longitudinal direction and a longitudinal length L from a rearmost heel location to a forwardmost toe location,

(b) all of the medial turning location is located between two spaced, parallel planes perpendicular to the longitudinal direction and located at positions 0.2L and 0.45L, respectively, along the longitudinal direction, measured forward from the rearmost heel location, and

(c) all of the lateral turning location is located between the two spaced, parallel planes.

23. An article of footwear according to claim **6**, wherein the article of footwear is a basketball shoe.

24. An article of footwear according to claim **6**, wherein the article of footwear is a high-top basketball shoe.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,907,363 B2
APPLICATION NO. : 14/691792
DATED : March 6, 2018
INVENTOR(S) : Smith et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page

Column 1, Item (71), Applicant, Line 1:
Delete "Nike, Incorporated," and insert --Nike, Inc.,--

Column 2, Item (56), Other Publications, Line 1:
Delete "Internattional" and insert --International--

Column 2, Item (56), Other Publications, Line 2:
Delete "Opininon" and insert --Opinion--

Signed and Sealed this
Ninth Day of August, 2022

Katherine Kelly Vidal

Katherine Kelly Vidal
Director of the United States Patent and Trademark Office